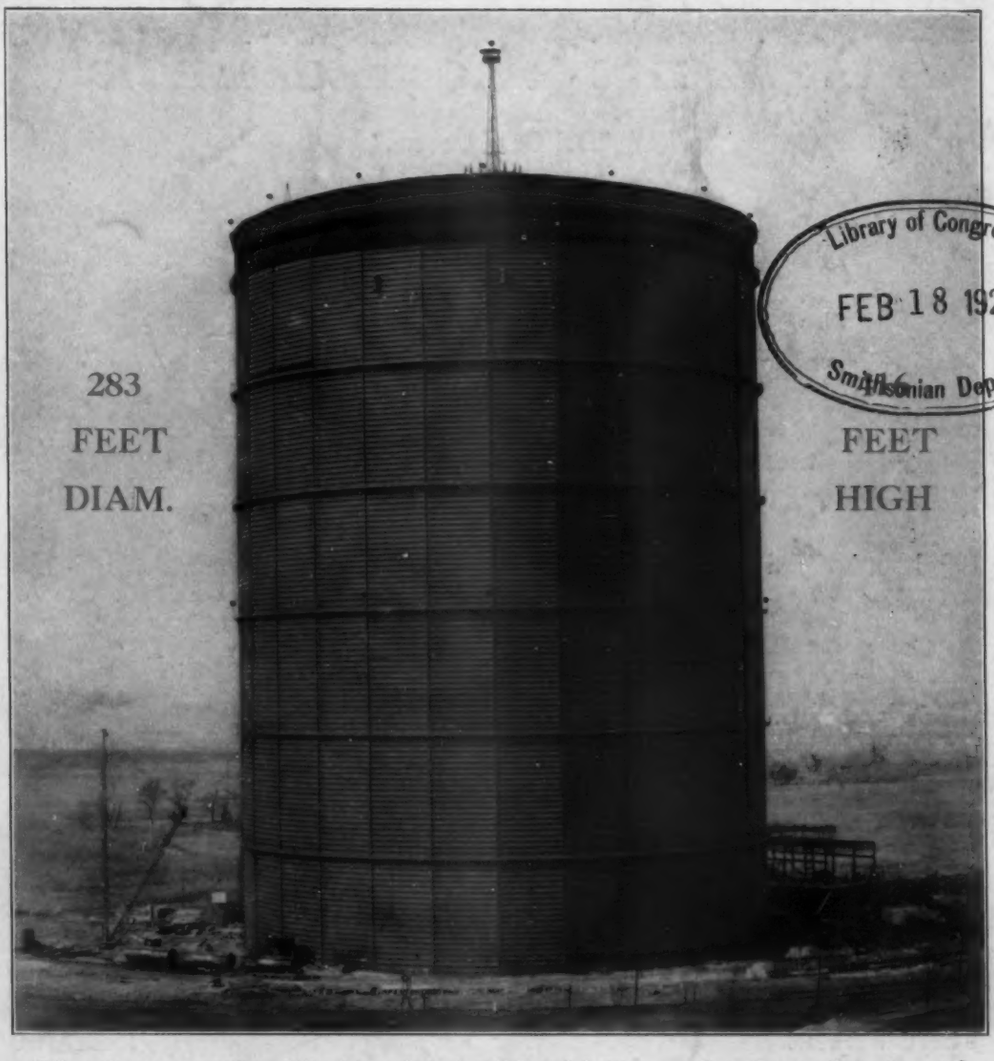
Vol. 130, Number 2 FEBRUARY, 1929 Price 25 Cents

AMERICAN GAS JOURNAL

Established 1859 Pioneer of the Gas Industry

Including · GAS INDUSTRY · Est. 1900 ·

20,000,000 Cu. Ft. Waterless Gas Holder



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The Largest Gas Holder in the World Recently Completed *For*
THE PEOPLES GAS LIGHT AND COKE COMPANY *By*

The BARTLETT HAYWARD COMPANY

Engineers & Founders

BALTIMORE and NEW YORK

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GAS DEHYDRATION

Arrangements have been completed with

W. C. Holmes & Co., Ltd., England

"Dri Gas Process"

and

The Koppers Company

whereby the gas dehydration developments of these two companies are now offered to the Gas Industry by

The Western Gas Construction Co.

(A subsidiary of The Koppers Company)

Gas Dehydration may now be adopted with the assurance that every practical requirement has been successfully attained.

THE WESTERN GAS CONSTRUCTION COMPANY

FORT WAYNE **INDIANA**

AMERICAN
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Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

Executive and Editorial Offices, 53 Park Place, New York City

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H. M. RILEY, *Editor*

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Vol. 130, No. 2 **February, 1929** Whole Number 3662

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AMERICAN GAS JOURNAL, January, 1929, Vol. 130. No. 1. Published monthly by American Gas Journal, Inc., at 34 N. Crystal St., East Stroudsburg, Pa. Executive, Editorial, and Business offices at 53 Park Place, New York, N. Y. Application made for entry as second-class matter, October 6, 1928, at the postoffice of East Stroudsburg, Pa., under the Act of March 3, 1879.

Subscriptions $2.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada $3.00; foreign $4.00. Single copies 25 cents.

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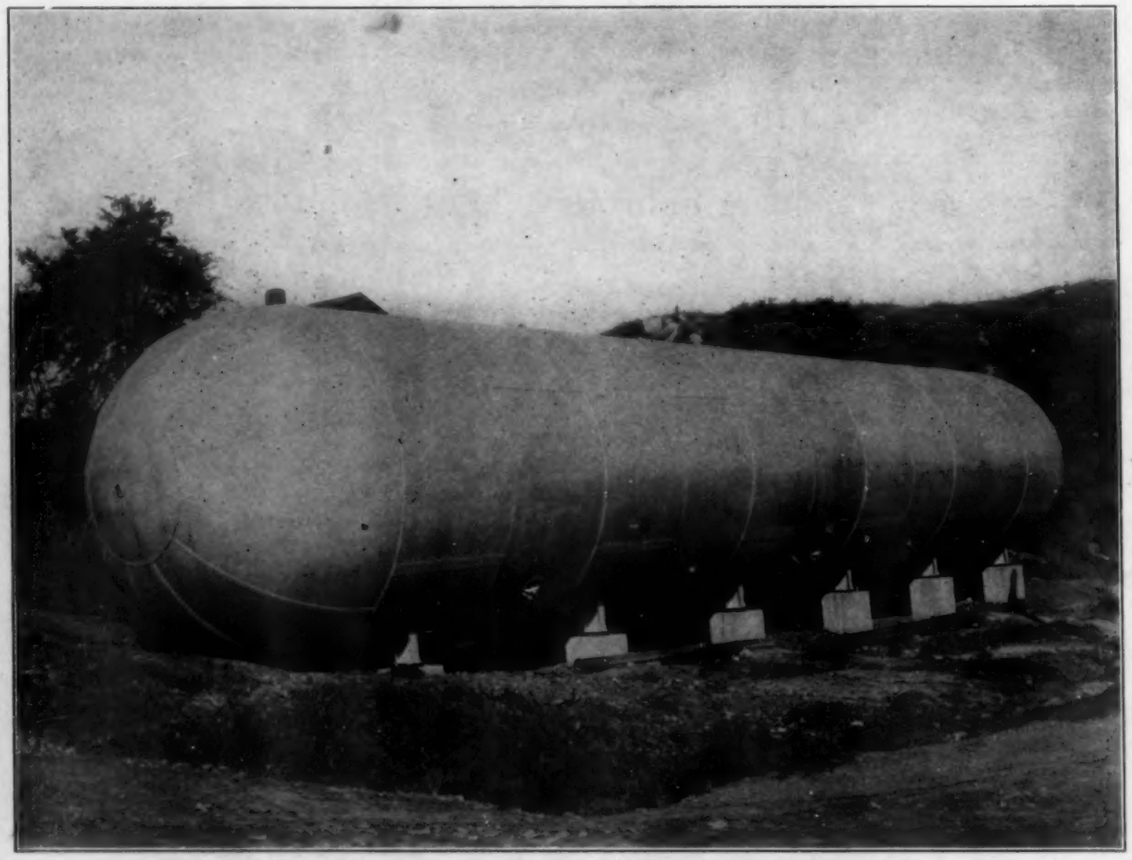
HIGH-PRESSURE HOLDERS
OF QUALITY



High Pressure Gas Holder 20' 0" diameter by 111' 0" long with hemispherical ends, having a storage capacity of 100,000 cubic feet between 5 lb. and 50 lb. pressure. Constructed at Easton, Pa., for the Easton Gas Works.

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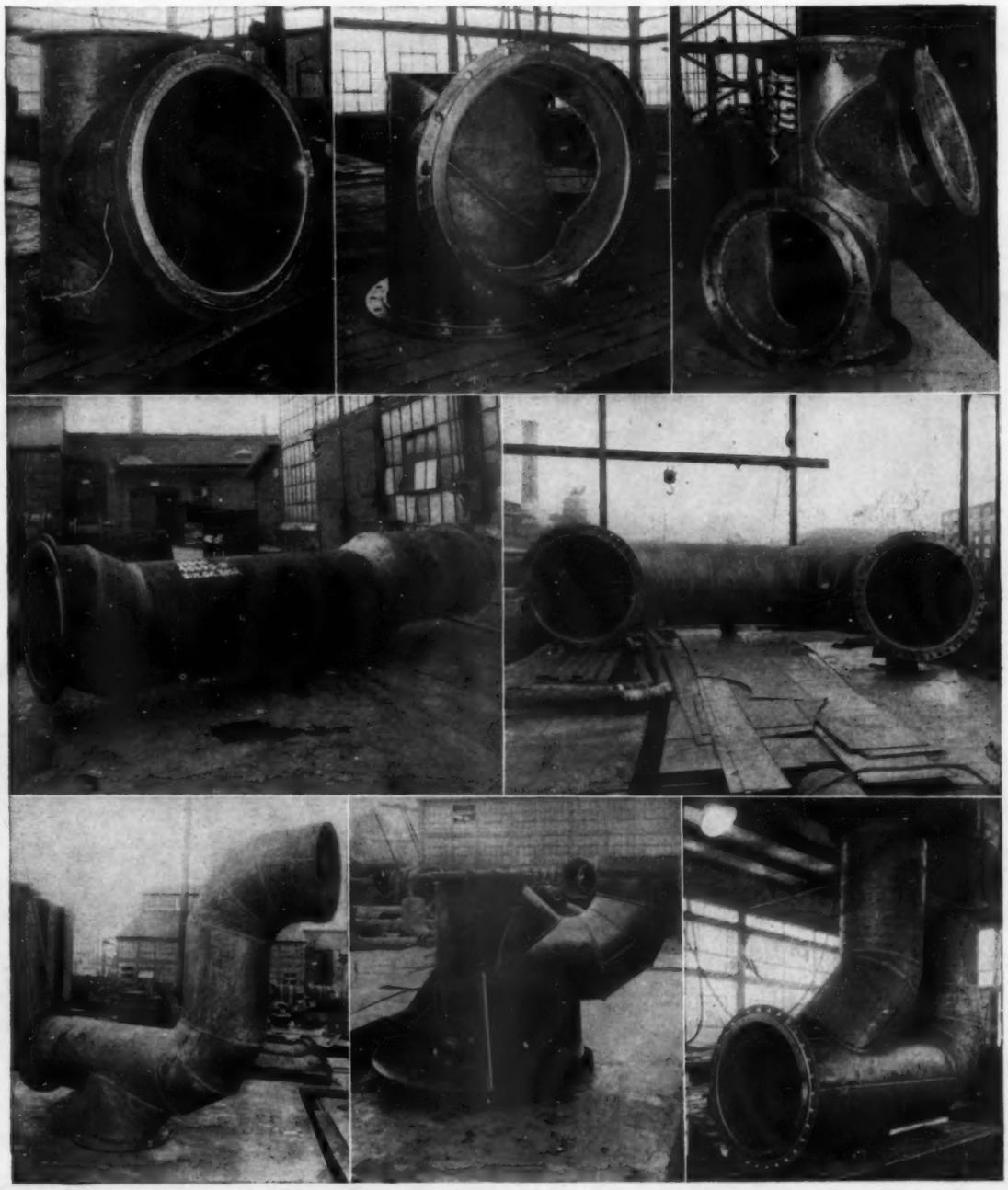

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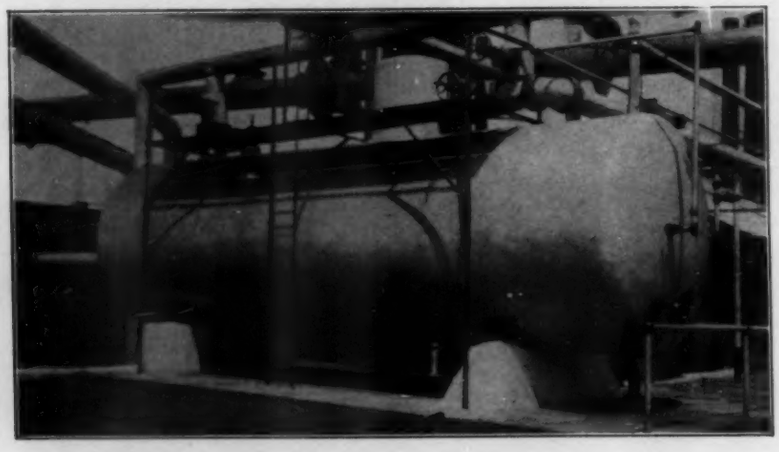
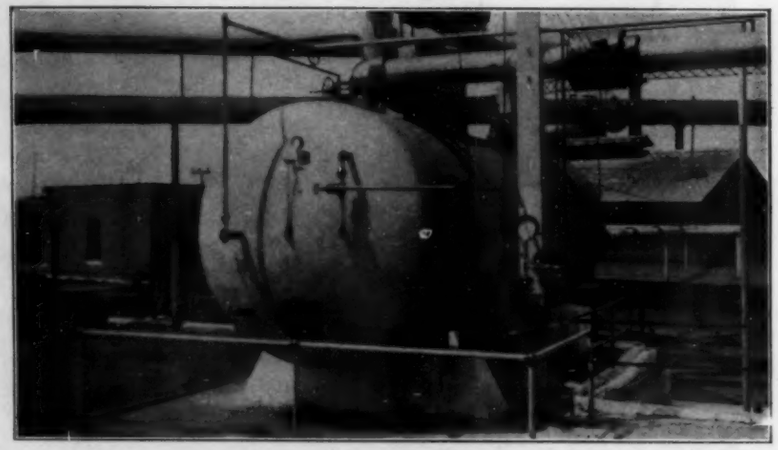
Over fifty water gas plants in the United States are successfully operating with Smoot Steam Accumulators.



Smoot Steam Accumulator at the Georgia Power Company, Atlanta, Georgia. The United Engineers and Constructors, Engineers.

Smoot Steam Accumulator at Georgia Power Company, Atlanta, Georgia, showing Smoot Control regulating steam pressure from Accumulator to Water Gas Machines.



SMOOT ENGINEERING CORPORATION
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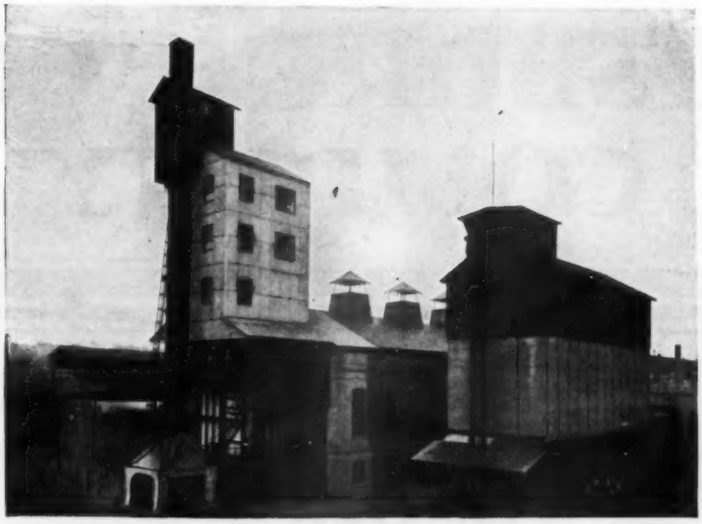
SMOOT CONTROL

FIRST INSTALLATION
IN THE UNITED STATES



U. G. I. INTERMITTENT CHAMBER OVENS
. . . . . AT DUBUQUE, IOWA

This installation produced these results (without steaming):

Average gas made daily	637,000 cu. ft.
B.t.u. value of gas	573
Yield per pound—dry coal	6 cu. ft.
B.t.u. value per lb.—dry coal	3438
Producer fuel—dry—as charged	241 lbs.

Other installations are now in operation at Racine, Wis., and Clinton, Iowa, and one is under construction at Bangor, Maine.

We would like to discuss with gas companies any questions of new plants, replacement units or any plans for modernizing which may be under consideration.

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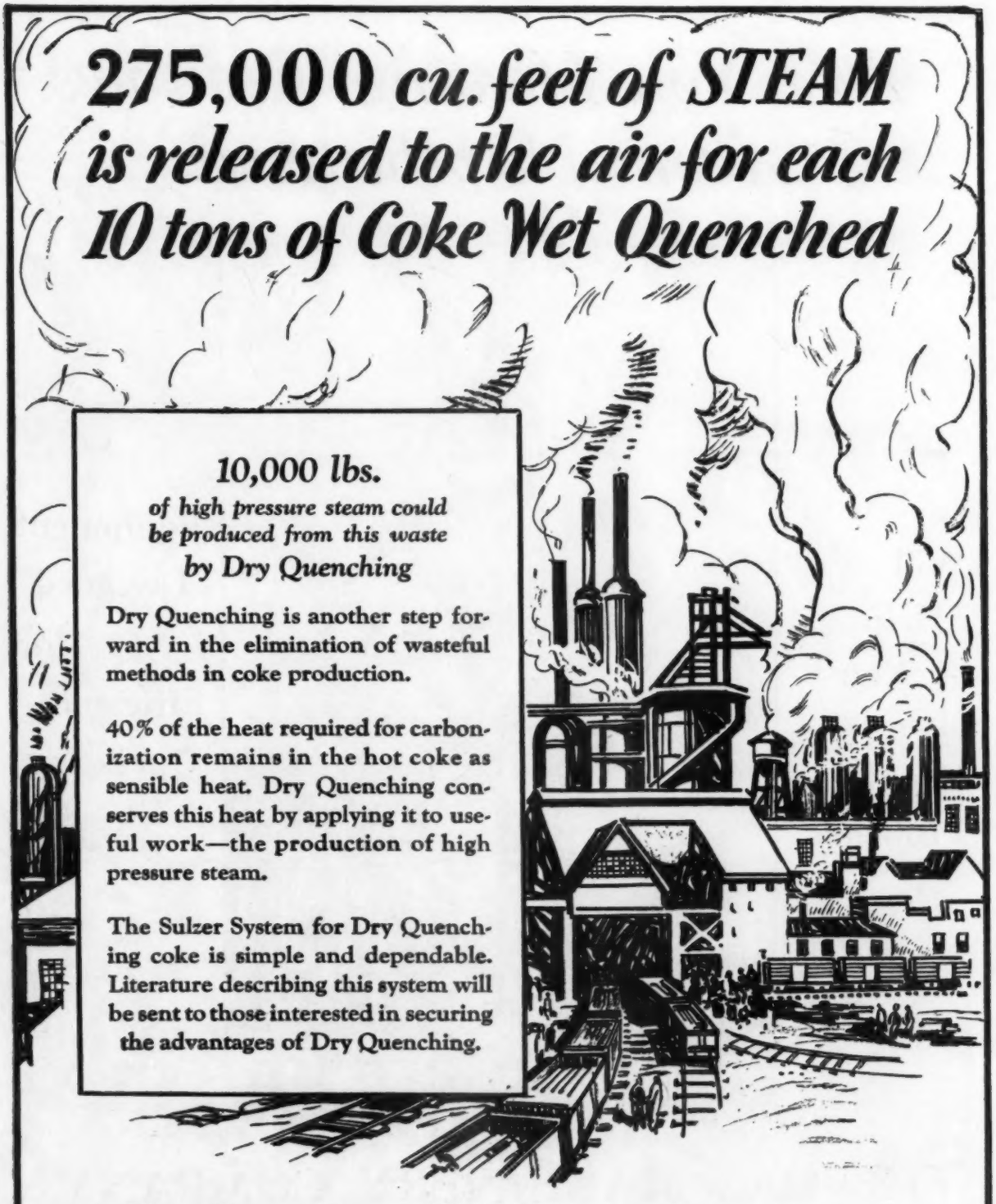
DIVISION OF
UNITED ENGINEERS & CONSTRUCTORS
INCORPORATED
DWIGHT P. ROBINSON, PRESIDENT
Broad and Arch Streets, Philadelphia

Chicago Atlanta

PITTSBURGH COAL
COMPANY

275,000 cu. feet of STEAM is released to the air for each 10 tons of Coke Wet Quenched



10,000 lbs.
of high pressure steam could be produced from this waste by Dry Quenching

Dry Quenching is another step forward in the elimination of wasteful methods in coke production.

40% of the heat required for carbonization remains in the hot coke as sensible heat. Dry Quenching conserves this heat by applying it to useful work—the production of high pressure steam.

The Sulzer System for Dry Quenching coke is simple and dependable. Literature describing this system will be sent to those interested in securing the advantages of Dry Quenching.

Dry Quenching Equipment Corporation

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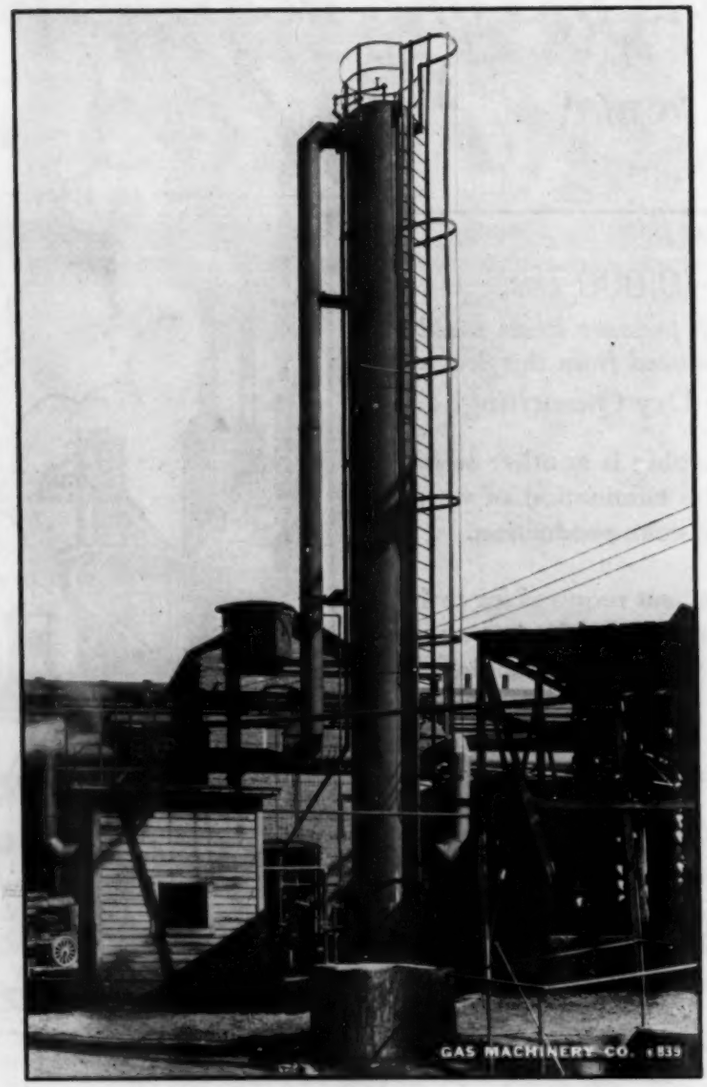
We Will Help You Solve Your Problems



Equipment Designed for Efficient Operating Service

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CLEVELAND, OHIO

New England Office, 185 Devonshire St., Boston, Mass. Edwin E. Witherby, Representative

The World's Largest Gas Holder — *and Connersville Boosters*

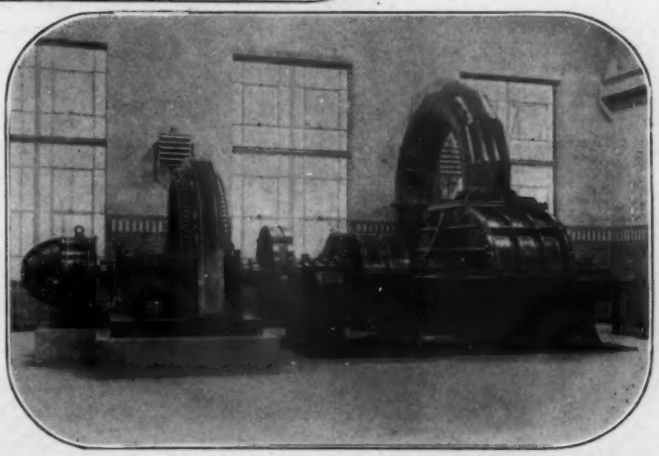
We are proud to be identified with this collossal 20 million cubic foot waterless holder recently completed for The Peoples Gas Light & Coke Company, Chicago, Ill., at their 73rd Street station.

Adjoining the site of this mammoth is a booster station housing two 500 H.P. Connersville High Pressure Pumps, with an hourly capacity of 750,000 cubic feet; or a 24 hour potential distribution capacity of 36,000,000 cubic feet. One of these pumps is driven by a gas engine; the other by a direct-connected synchronous motor.

A pumping station containing Connersville equipment of equal size, adjoins the company's 15 million cubic feet waterless holder in another section of the city.

The simplicity, ruggedness, accessibility, dependability and low cost of operation, which characterize all Connersville Gas Apparatus, and which was so ably demonstrated in the older station, were contributing factors in choosing the equipment for the new booster station, and is also the reason why many users, large and small, reorder Connersville equipment, without competitive quotations.

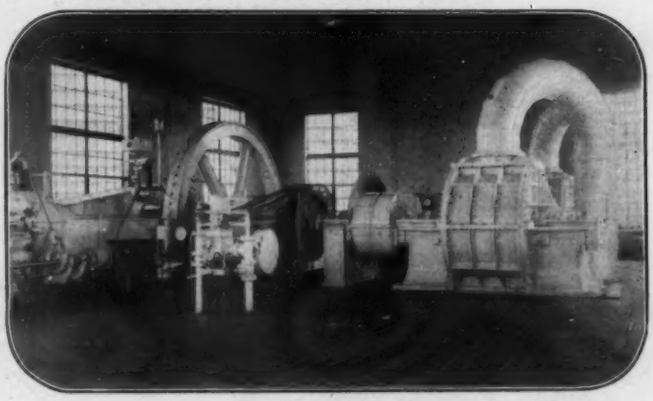
Write for Catalog 22; or consult our nearest office.



Top view shows Gas Engine driven unit

Center shows motor driven unit in the new Booster Station.

Lower view shows a duplicate Booster installation at the North Shore Station.



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Chicago — Pittsburgh — Boston — New York

CONNERSVILLE

Blowers • Gas Pumps • Meters • Cycloidal Pumps

IN THE FIRST YEAR

From the very beginning SMITH *Welded* line pipe found its place—significantly—in the pipe line structure of companies that have had many, many years of experience in pipe line construction and operation.

SMITH *WELDED* GAS LINE PIPE

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OIL AND GAS FIELD PRODUCTS DIVISION
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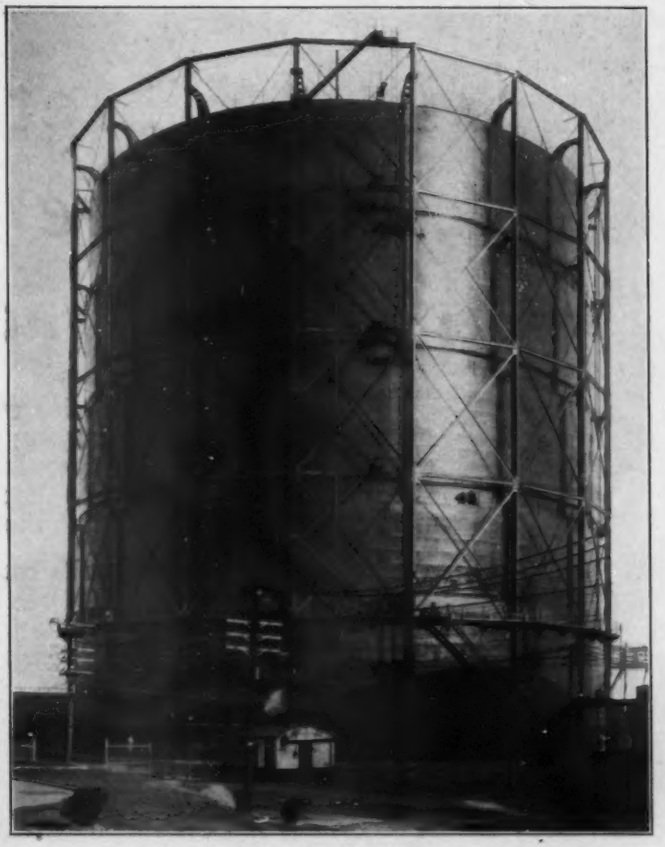
STURDY

CONSTRUCTION PAYS



3,000,000 cu. ft. Holder, Built in 1928

INTEGRITY
FAIR **C-K CO** DEALING
SERVICE

CRUSE-KEMPER CO.
AMBLER, PA.
ENGINEERS & CONTRACTORS
BUILDERS OF STURDY GAS HOLDERS
PURIFIERS, SCRUBBERS, CONDENSERS, TANKS, ETC.

A MUELLER Meter Hanger *is something more than just a piece of metal*

THOUGH there's a pattern for every type of installation to meet the varying needs of gas companies — there is an identical quality in all Mueller Rigid Bar Connections that sets them a little apart from the general run of the market.

Compare them with any other units for strength of material and design, for compactness and for the practical simplicity that cuts installation costs and gives added years of trouble-free service.

Mueller's seventy-odd years of quality manufacturing for the gas industries make the purchase of Rigid Bar Meter Hangers *an investment in confidence.*

MUELLER CO. *(Established 1857)* **Decatur, Illinois**

Branches: **New York, Dallas, San Francisco, Los Angeles**

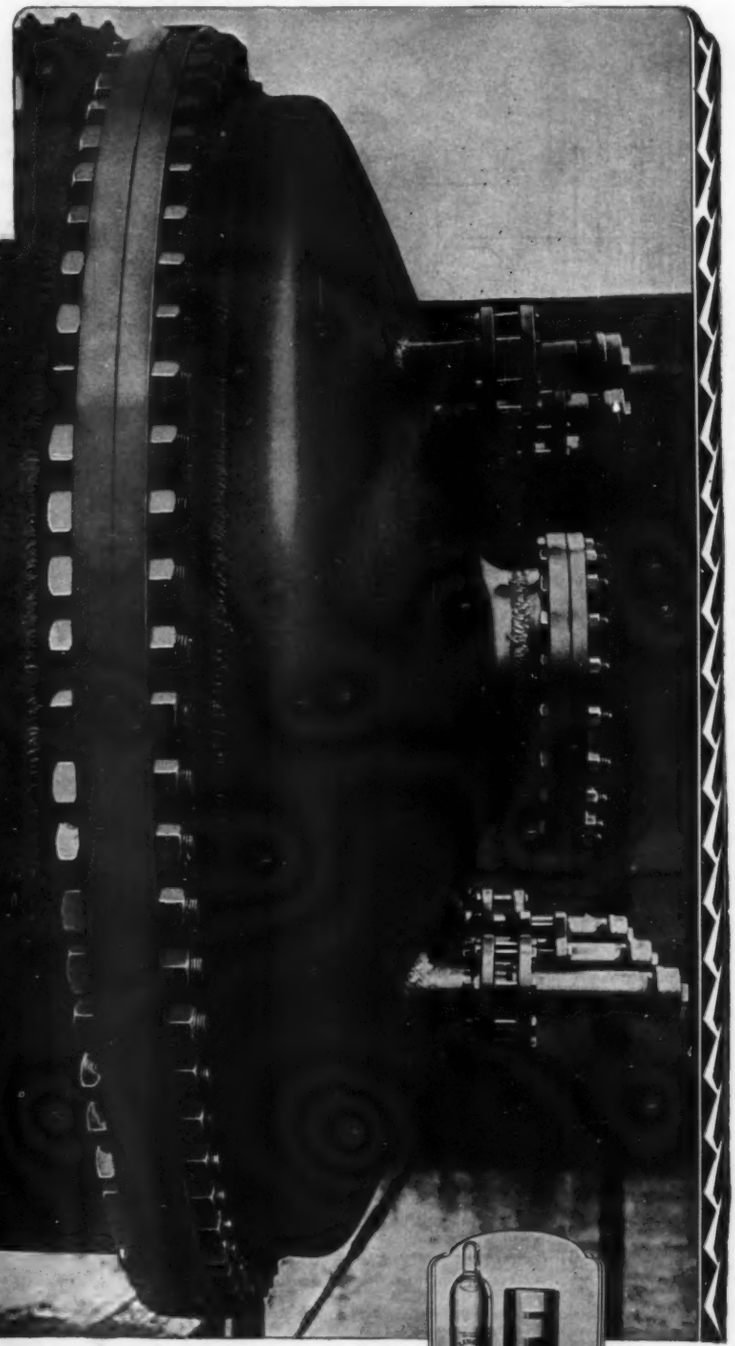
Canadian Factory: **MUELLER, Limited, Sarnia**

MUELLER

Write for detailed descriptions of these and other Mueller products for the gas industry.

"A properly made oxy-acetylene welded joint is as strong as the base metal, fully 100% efficient . . . ."

"Properly made" means made under procedure control,—produced under standards dictated by the best engineering practice.



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~

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Units of

UNION CARBIDE AND CARBON CORPORATION

General Offices UCC *Sales Offices*

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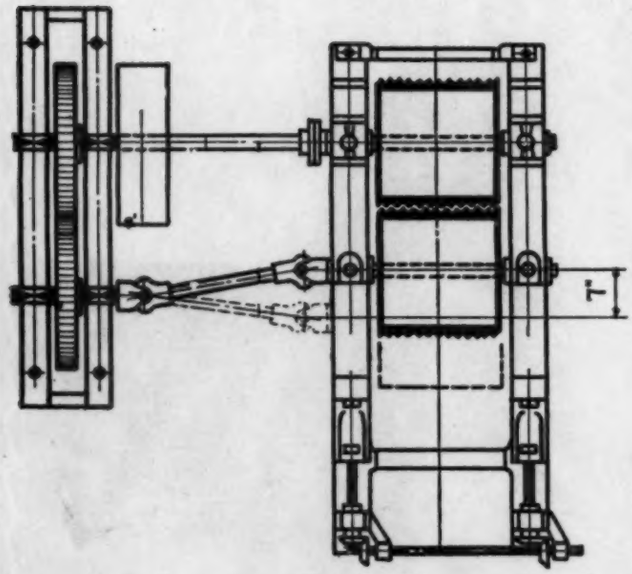
55 Oxygen Plants—36 Acetylene Plants—99 Oxygen Warehouses—100 Acetylene Warehouses—38 Apparatus Warehouses—235 Carbide Warehouses

Note the Simplicity of the Drive

on the Robins Adjustable Crusher



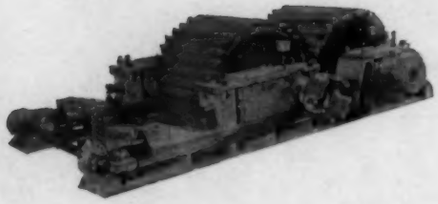
IN considering an *adjustable* coal crusher, always make note of the drive arrangement. The simpler this drive is, the more practical will be the machine.

With the Robins Adjustable Crusher, note the simplicity of its drive.

The driving gears remain in position between two pairs of fixed bearings. One roll is fixed and the other moveable.

The connection between the gear and the movable roll is by means of a pair of universal joints and a wobbler shaft.

The movable crusher roll setting can thus be made (even while in operation, if desired) without affecting the operation of the drive gears.



Several advantages are at once apparent: all varying gear centers, sliding gears, and bevel gears are eliminated; the opening between the rolls can be varied at will, even during operations; all parts are more accessible.

When you install the Robins *Adjustable* Crusher, you install a simple crusher, a practical crusher, an efficient crusher.

Adjustments on the Robins Adjustable Crusher can be varied to give products ranging in size between 1" and 8".

Robins also makes a full line of standard rigid coal and coke crushers and special type crushers to meet special conditions.

ROBINS CONVEYING BELT CO.

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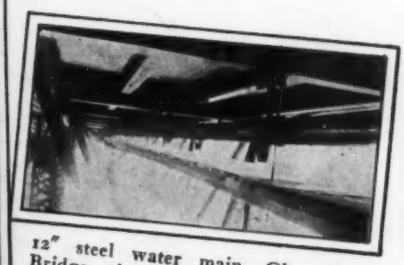
MATERIAL HANDLING ROBINS EQUIPMENT

"FOR EVERY JOINT ON THE LINE"

Oil line connected with Victaulic Couplings.

20" steel sewer, Glen Road Bridge, Toronto, using Victaulic Couplings



12" steel water main, Glen Road Bridge, also connected with Victaulic Couplings.

VICTAULIC COUPLINGS

Permanent leak-tightness under conditions of low and high pressure, immunity to joint damage by vibration and freedom from distortion due to contraction and expansion of the pipe lengths are some of the reasons why Victaulic Couplings were selected for the sewer and water lines suspended under the new Glen Road Bridge at Toronto. They have won for Victaulic Couplings wide use by leading oil production and mining companies.

Victaulic Couplings assure leak-proof joints for the life of the pipe. They can be installed by primitive, unskilled labor at low cost, and faster than any other type of joint. Each Victaulic Coupling gives a flexible joint which takes care of contraction and expansion in the pipe lengths it connects.

Victaulic Couplings are supplied for all sizes of steel, wrought iron and cast iron pipe for all sizes from ¾ inch up—for all pressures from vacuum to ten tons pressure per square inch. Victaulic Fittings make it easy to tie in to any existing lines.

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The all-purpose coupling.

"For every joint on the line."

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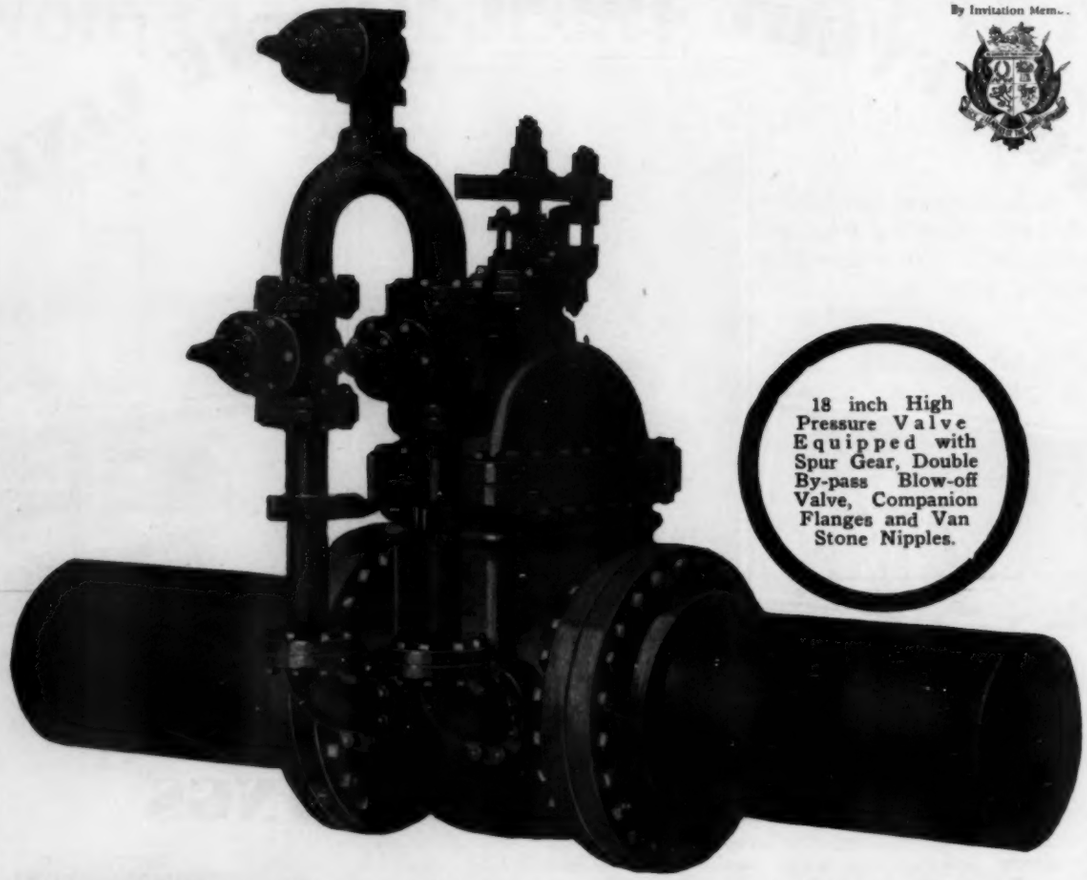

18 inch High Pressure Valve Equipped with Spur Gear, Double By-pass Blow-off Valve, Companion Flanges and Van Stone Nipples.

Double Gate Valves for Gas Lines

Realizing the futility of manufacturing a valve only as good as those already in the field, we have spent many years in experiment and study with principle, design and construction—our sole aim the building of a valve which will immeasurably outclass its type.

Darling Double Gate Valves have proved to many of the largest companies the result of specialization—a result which the most vigorous tests have already shown exceeds our expectations and more than justifies our efforts.

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DARLING VALVE & MANUFACTURING CO.

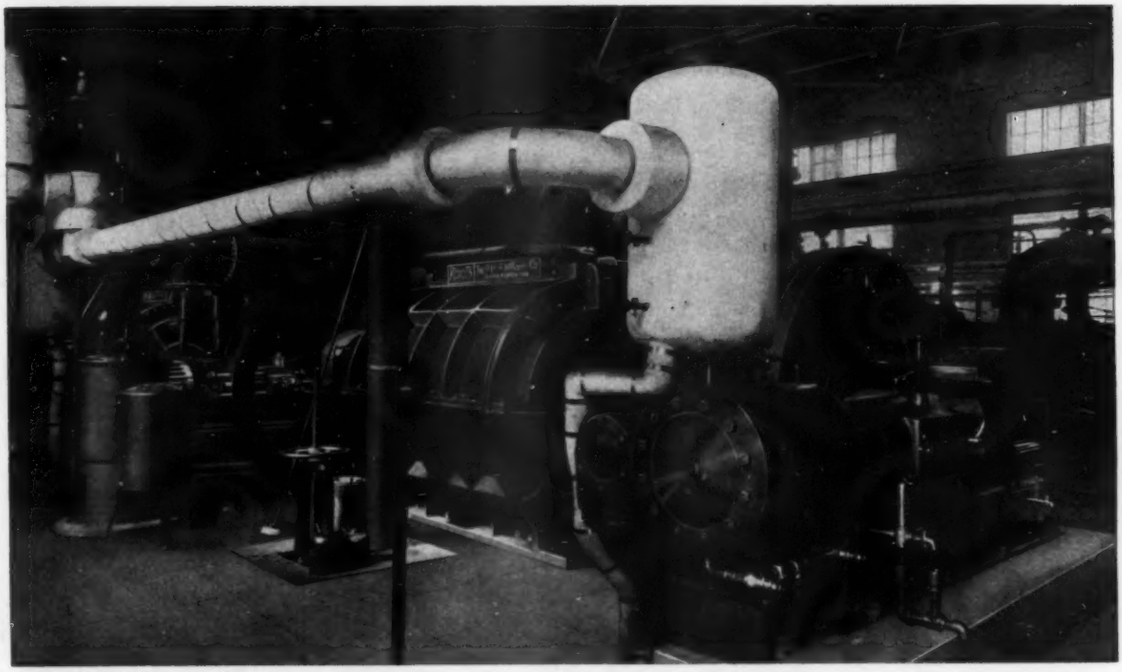
Williamsport, Pa.

NEW YORK CHICAGO OKLAHOMA CITY HOUSTON

DARLING

GATE VALVES

ROOTS



ROOTS

Two Roots No. 14 Heavy Duty Gas Pumps with Double Engine Drives installed in Eastern By-Product Coke Plant.

Roots Service

Roots service is dependable, satisfactory service. From conception to the finished product every detail is carefully wrought and inspected.

Oversize shafts, heavily ribbed cases, adjustable self-oiling bearings, sturdy gears of *conventional* 14½° involute tooth design, exact clearances, and the absence of internal friction mean added service from Roots Gas Pumps.

Secure the best by specifying that it be a Roots product—regardless of whether you need a Gas Pump, Meter, Vacuum Pump, Liquid Pump, Blower, Pressure Regulating Valve or Coupling. Write for details.

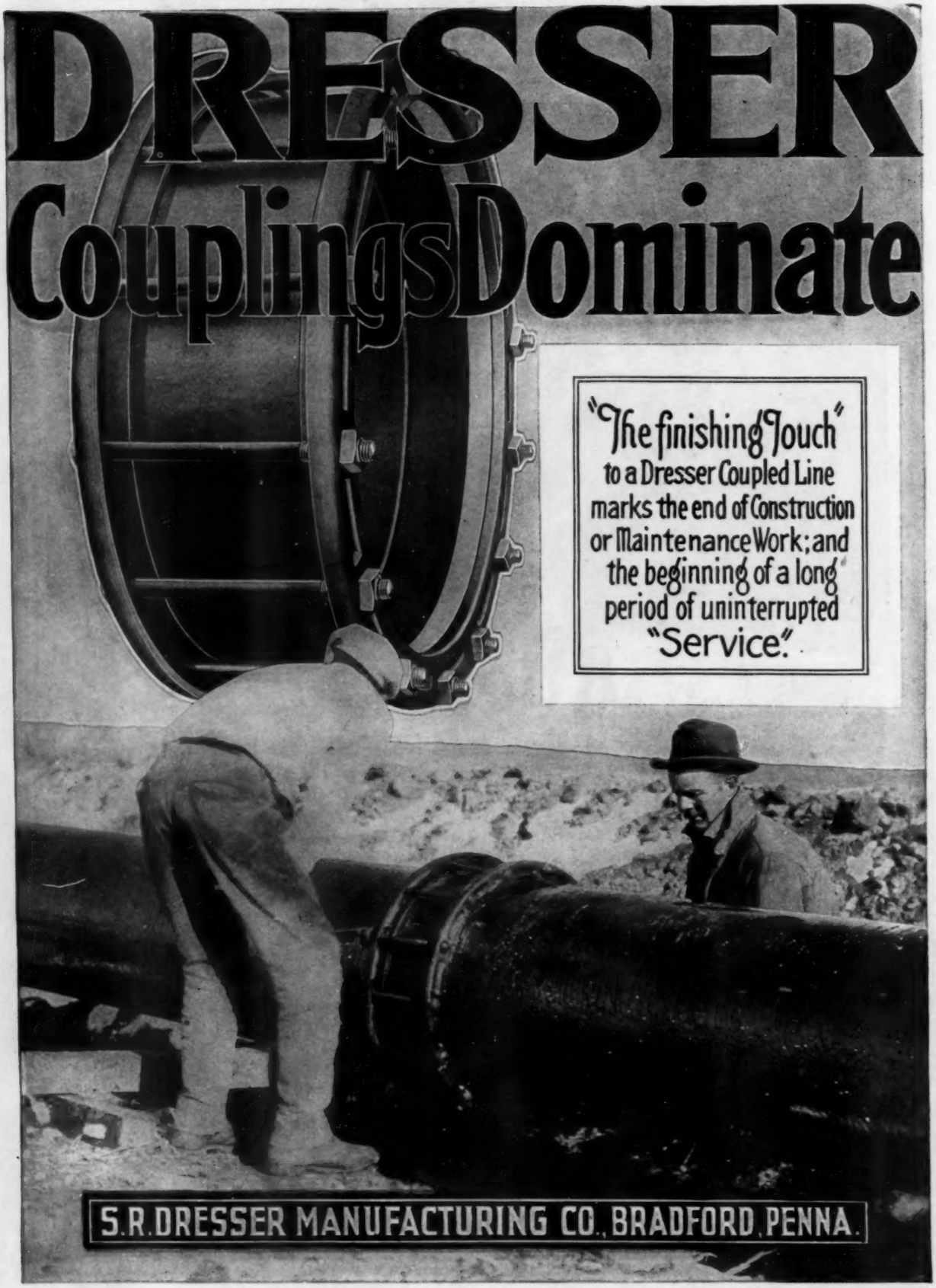
The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

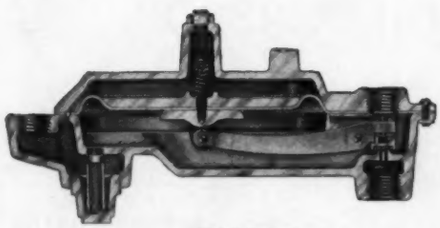
CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

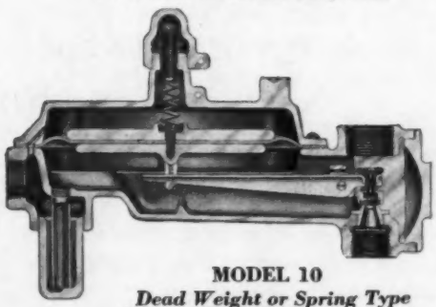
Originators of the Double Impeller Rotary Principle


DRESSER
Couplings Dominate
"The finishing Touch"
to a Dresser Coupled Line
marks the end of Construction
or Maintenance Work; and
the beginning of a long
period of uninterrupted
"Service."
S.R. DRESSER MANUFACTURING CO., BRADFORD, PENNA.

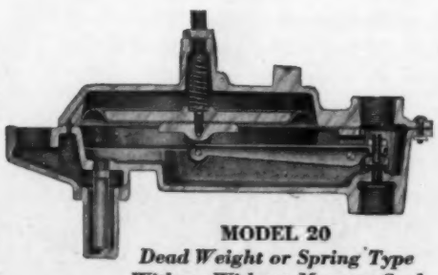
More and more GAS ENGINEERS ARE REALIZING THE ADVANTAGES OF Reynolds Gas Regulators



MODEL O
Spring Type Only
With or Without Mercury Seal



MODEL 10
Dead Weight or Spring Type
With or Without Mercury Seal



MODEL 20
Dead Weight or Spring Type
With or Without Mercury Seal

EVERY need in the Service Regulator Field is completely supplied by Reynolds. No attempt has been made to answer the varying requirements with only one model. Reynolds offers three, each supreme in its particular field. Model O, the old standard, has successfully served for a quarter of a century—Model 10 features all working parts accessible and interchangeable while in pipe line.—Model 20, working parts are so accurate as to permit complete interchangeability in shop. Complete data on Reynolds Service Regulators on request.

Reynolds Gas Regulator Company

Anderson, Indiana

ESTABLISHED 1892

Representatives: EASTERN SERVICE COMPANY, Boston, Mass. F. E. NEWBERRY, Avon, N. J. THOS. C. CORIN, Detroit, Mich. GILLESPIE & SCHWAN, Inc., Dallas, Tex.

The BARTLETT HAYWARD CO.

Engineers and Founders

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Complete Coal Gas Plants
By-Products Plants
Salt Water and Fresh Water Condensers
De Brouwer Charging and Discharging Machines
Purifiers - Steel Tanks - Shaving Scrubbers
Vertical Waste Heat Boilers
Gas Holders

View of Main Plant, Located at Baltimore

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

HENRY M. RILEY, *Editor*

Size and Service

MOST INDIVIDUALS, prompted perhaps by the same urge that tickles their funny bone when a "comic strip" female belabors her husband's pate with a rolling pin, take a peculiar delight in being on the alert to spy out and criticize the mistakes of any large organization.

People seem to feel that as any institution becomes larger its service should increase in quantity as well as quality. Indeed, reducing the matter to a mathematical basis, if a business concern doubles in size they are irritated if its service does not increase at least three-fold. The "big fellow" or champion is extended passing toleration so long as he continues to break records; that is what the average individual expects of him. But, once let him pause to take a hitch at his belt or indulge in a moment of breath taking and the thumbs are pointed down with amazing alacrity. Comes apace a right vigorous clamor on the part of the gallery, accompanied by a hearty spell of tub thumping to the effect that the "big duffer" never was much good and deserves nothing short of a good round trouncing.

Whether such a state of affairs can ever be overcome by education and common sense is problematical, even though the educational efforts are always in order. The important thing is that the fact exists and must be handled as painlessly as possible.

OUR OWN INDUSTRY has had some experience along the aforementioned line. To be specific: Mrs. Doe buys a gas range and wants it connected at a certain time. The promise is given but in transit the truck meets with an unavoidable accident and the range is connected three hours late. Result: Mrs. Doe is quite likely to indulge in a spell of fault finding with the idea uppermost that the gas company is sufficiently big to be able to not make mistakes. At all events such a tendency toward complaint would not be so pronounced were she dealing with some other concern relatively much smaller. She and many others unconsciously couple size with quality of service, but her demands for the latter are many times way out of proportion. We are all familiar with such propensities on a much larger scale, where the individual increases to such a size as to be called the public and the particular demand is of much greater consequence.

Gas company employees and executives would do well to bear in mind that the fact that they are helping to run a big organization does not in itself guarantee a kindly public attitude. Size carries its penalties and the employee should be ceaselessly vigilant to the end that he will measure up in a big way and endeavor to render service accordingly.

Never Too Late

ONE OF OUR large universities, after very careful investigation, has ascertained that age has practically nothing to do with the ease with which an individual absorbs and retains knowledge. That is to say, a man in his fifties or sixties learns just as readily as a much younger person. Further, and what is indeed surprising, students well advanced in years can master and complete a difficult course of study during the evening or off-hours in the same space of time as a day student, who is supposedly devoting his entire time to the course. In other words, an engineering course, say, that normally takes four years for a full day-time student can be completed by many men in the same time during their evening hours.

These findings happily give the lie to the old adage that "you cannot learn an old dog new tricks," and should be very satisfying to those gas company executives who had the foresight a number of years ago to encourage their employees to pursue some line of study during their hours of leisure.

The various operations incident to the carrying on of a gas company's work, probably actively touch upon as many branches of engineering as any large industry, and further, these phases are increasingly changing and improving. Consequently, key men and those who aspire to administrative position will be of value to their company in direct proportion to the extra study and investigation they indulge in. Beal Medals and increases in salary are not gained by those who enter a gas company with an engineering degree and then float along with the tide. The same holds true for those who feel that they have reached the age when they can no longer absorb additional knowledge with facility.

Woodman, spare (not) that tree!

The Gas Industry offers fine opportunities to those who will study its needs. And the man in his fifties who nurses the germ of an idea that he would like to pursue some course of study on the outside might, if he were to try out the matter for a term, surprise himself,—and some of the "collegians" who erroneously expect a degree from the university to carry them along.

It is interesting to speculate what influence the above mentioned findings of the university might have on age as a bar to a healthy mentally well equipped applicant for a position.

Looking Ahead

AT SUCH A TIME when considerably more than half our output of gas is used for Industrial consumption we will most likely find that the curve of our income will somewhat parallel the curve of the general prosperity of the country. Then indeed, we will have need for engineers and superintendents who know a great deal of general business conditions over and above those affairs of the industry which they are depending on for their livelihood. If our assumption is reasonably correct we would, during a bad business slump, see our curve of output dipping exasperatingly downward, because obviously curtailment of factory production would bring in its train a direct lessening in fuel consumption.

In turn, gas company earnings would be somewhat affected. Naturally at such a hypothetical time we would of necessity have to follow the general economic trend, for we could scarcely hope to evolve suddenly new uses for our product.

Gas engineers and other important men in the Industry must increasingly study and put into effect more economical ways of carrying out the various operations, always with the idea uppermost that new manufacturing apparatus and equipment, mains extension, new office buildings, new rates and the like can only be considered after a careful and economic study of the needs of the future. They must also keep posted as to the new outside industrial trends and accommodate their product to them. And above all, our Industrial Sales must be diversified, so that all our eggs will not be in one basket.

When we consider that house cooling is worthy of immediate study and that the production of motor fuel looms as a future possibility, it can be realized that we

have need for engineers with a very broad perspective of general business trends. Engineers so qualified will go far toward checking the precipitate drop in our output curve referred to.

Good Prospects

ELSEWHERE in this issue will be found a forecast of the country's building operations for the current year. In addition there will be noted some estimates of appliance and gas sales which have a direct bearing on these operations.

A casual inspection of these data should be comforting to the Gas Industry, but the degree of satisfaction to be derived will, at the end of the year, be directly proportional to the energy and determination which are put into sales efforts.

Some Commercial Departments might find it worth while to establish a quota for various appliances based on the data indicated and then aim to attain a high percentage of this quota by the end of the year. Regular planned meetings with the local architects and weekly visits to the Building Inspector's office should materially assist in swelling such a percentage. At several opportune times during the year, preferably just prior to the seasons of greatest home building activity, the gas company might find it profitable to mail their customers an attractive folder or stuffer telling them what gas appliances will make their proposed new home more modern, convenient and livable.

The Industry simply must "cash in" on these new prospects.

Oil Supply and House Heating

THE STATUS of oil production in this country was dealt with at length in the January 20th issue of the New York World. One significant feature of the article in question was the forecast that by 1938 we would be producing appreciably less than half the country's consumption of oil. In turn this would mean that the deficit would have to be taken care of by imports of oil, principally from Mexico and South America.

The effect of such a situation would undoubtedly tend toward an increase in the price per gallon. And this increase might be the deciding factor in many instances as to whether a number of prospects for oil house heating would adopt this scheme of heating. Indeed, it might further cause many who were already heating their homes with oil to abandon their oil burners in favor of some other fuel. Oil burners and equipment run into a fair sum of money and it would seem that any abandonment of such apparatus would entail a definite amount of loss on the part of the tenant or house owner.

It is by no means suggested that in marketing gas house heating the salesmen be unethical by way of raising a hubbub that the price of oil for domestic heating is soon going to jump to prohibitive heights. However, through legitimate channels of publicity and otherwise the active prospect for house heating with fuel other than coal or coke should be posted, so that he can weigh matters and decide whether he wants to tie up a relatively large amount of capital in equipment whose use he might find it advisable to dispense with at too early a date. After all, it is very much more likely that the price of oil will advance than the price of gas.

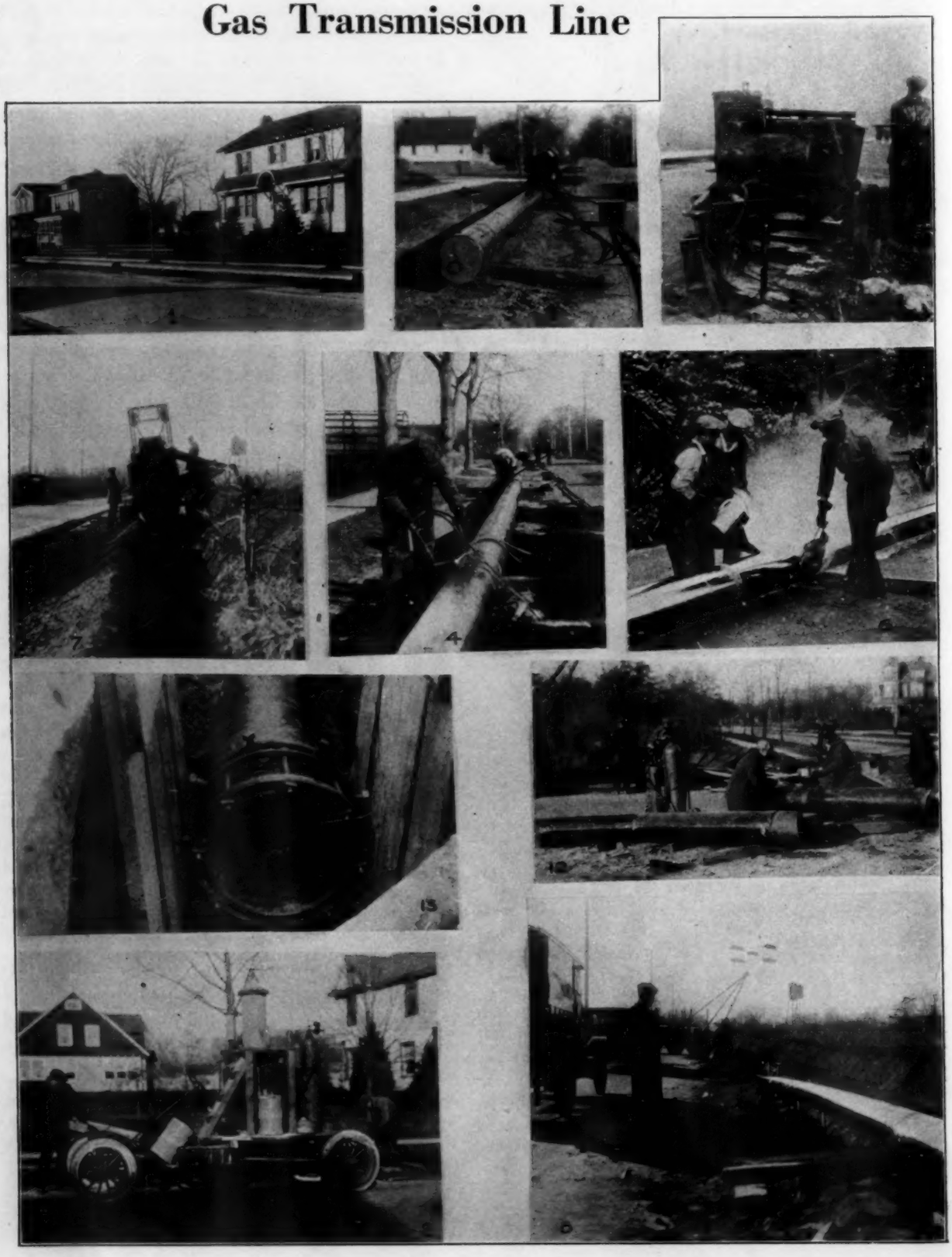
Appliance Testing Laboratories

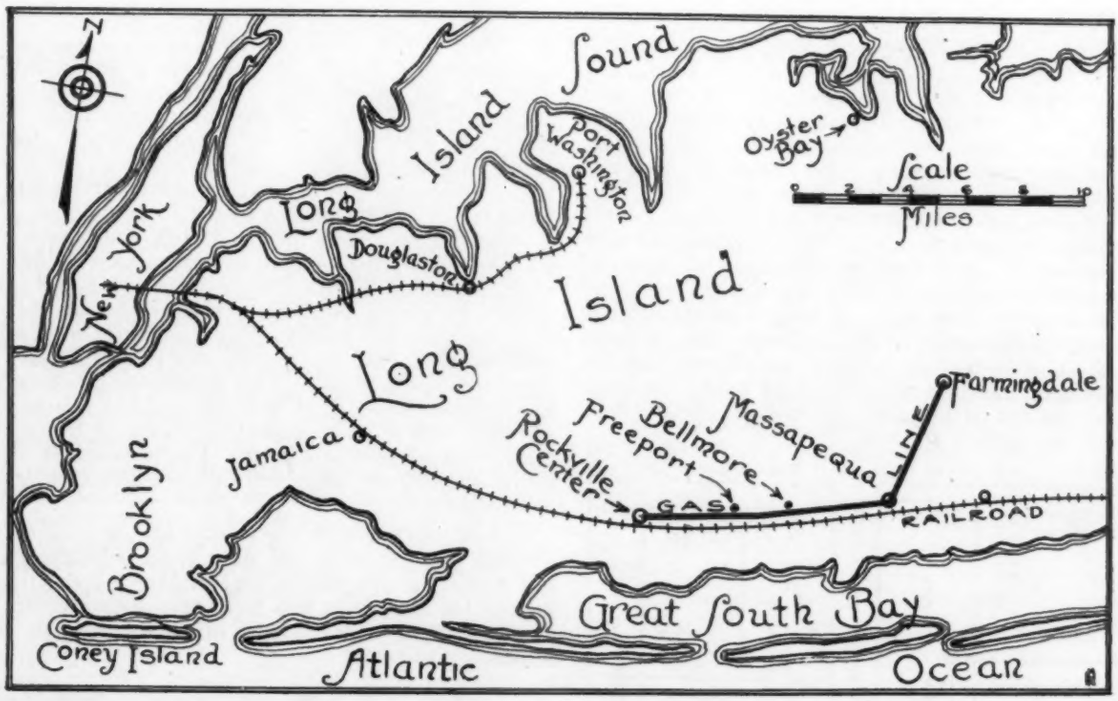
NOTWITHSTANDING the excellent work being done by the A. G. A. Testing Laboratory at Cleveland a number of companies have found it advisable to supplement this research and investigation by way of maintaining Appliance Testing Laboratories of their own. Thereby they are able to take the findings of the Cleveland laboratory and continue their own testing to accommodate the particular appliance to the needs of their own type of gas and service.

By the above cooperation or supplementary investigation the customer is assured a maximum of satisfaction with his gas utilizing appliances and equipment.

Any sizable gas company can well afford to give consideration to the proposition of establishing a carefully and accurately conducted testing laboratory. And incidentally, a variety of profitable tests, aside from the testing of appliances, could be handled in a laboratory. With the proper man at the head of such a laboratory the venture should amply pay for itself.

Teamwork, The Keynote in Laying Long Island Gas Transmission Line





New Fifteen Mile High-Pressure Gas Transmission Line

Oxwelded 12-In. Pipeline to carry 45 lb. per Sq. In. Pressure

By W. I. Gaston,
The Linde Air Products Company

AS AN important part of the present Long Island gas development program a 79,000-ft., 12-in. pipeline is being laid by E. L. Phillips & Company to tie in the Far Rockaway plant of the Queensborough Gas & Electric Company with the Long Island Lighting Company's Bayshore plant. It is strictly a transmission line, and except in a few isolated cases, no service will be taken directly off the line. This line, which is to carry 45 lb. per sq. in. pressure, is being constructed in accordance with the latest engineering practice and has several interesting features.

In order to insure permanent tightness of the joints, they are being welded by the oxy-acetylene process. Dresser couplings are used at intervals to allow for expansion and contraction due to temperature changes. Usually the pipe is lowered into the trench in 400-ft. sections.

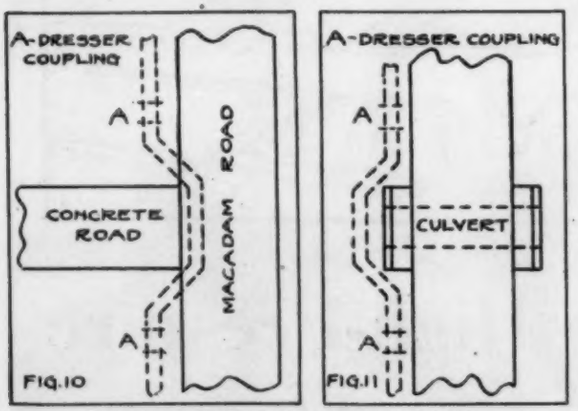
For the major portion of the extension the route was within the corporate limits of several towns along principal thoroughfares which meant considerable traffic conditions to contend with and in order that unfavorable public opinion and inconvenience be reduced to a minimum, the trench opened was limited to 1000-1500 feet at a time. A very efficient organization has been developed for performing the work. Procedure for actually laying the pipe will now be described.

The pipe was shipped from the steel mills to several selected or convenient sidings adjacent to the project and then distributed on trailers along the route, the loading, unloading and hauling of trailers being accomplished by derrick trucks. The pipe was furnished in standard (40 ft.) double random lengths, with ends leveled at each end for field welding, this pipe being laid out on skids preliminary to aligning and welding up into sections as shown in Fig. 1.

As the line progresses, the generator wagon, which in this case consists of a Ford truck from which the motor has been removed, is towed up to the head of the line by means of a motor truck. An acetylene generator, of standard make, and three oxygen cylinders, are mounted on the generator wagon, as well as spare drums of carbide and boxes of welding rod. This arrangement is shown in Fig. 2. Two lengths of welded, small-diameter pipe extend for 200 ft. behind the generator

wagon. These pipes have hose connections at suitable intervals and supply the main welding crew with oxygen and acetylene.

Before the arrival of the main welding crew, each pipe length is carefully swabbed out to insure the exclusion of all dirt, pebbles, leaves and other foreign materials and wooden plugs of the type shown in Fig. 3 are then inserted in the ends of the pipe. When the welding crew moves up, members of it align and space the sections of pipe on the skids and lengths of pipe are secured by four tack welds spaced at intervals around the circumference. Joints are then completed by the main welding crew, as many as four welders working simultaneously on this particular job. Helpers turn the pipe with chain tongs at such a rate that the welders are constantly working in an upper quadrant, or near the top of the joint. Fig. 4 shows a view of some of the welders at work.



Offsets around cross streets and culverts

Every welder has previously passed a rigid qualification test, consisting of welding specimens which were tested for strength, and has been selected with care. He is also required, upon completion of a joint, to weld in a short piece of welding rod, heated and flattened at the end and stamped with his number. Thus responsibility for the quality of each weld is definitely placed upon the individual who made it.

When the welding of a particular section of the main has been completed the surface of the pipe is carefully cleaned and the protective coating applied. The priming coat is first brushed on and when thoroughly dry the final coating of enamel is made. Fig. 5 shows the type of outfit in which the enameling material is heated by means of a kerosene torch. It is poured onto the top of this pipe from buckets and spread over the under surface by means of a canvas band as shown in Fig. 6.

A trench digger, of the type shown in Fig. 7, follows up the welding crew. The trench is shaped up by hand labor, where necessary, and cribbed.

Pipe is lowered into the trench by means of an "A" Frame Derrick mounted on a motor truck. Fig. 8 shows this device in operation. Props are placed under the rear end of the truck frame when a heavy load is on the derrick. A severe strain will be noted at one of the welds where the pipe section bridges over the skids. Four 4 by 4-in. white oak skids laid in a row, as also seen in Fig. 8, have been found superior to single skids of larger size. They are placed at intervals of about 100 ft. The derrick truck is moved along the section, the pipe raised, skids removed one by one, and the pipe lowered into the trench.

Occasionally where the pipe while suspended by means of the derrick is not directly over the center of the trench by allowing the pipe to swing under or come in contact with the two rear members of the derrick and then manoeuvering or backing the truck the pipe is gently bulldozed into proper position. It should be noted that a canvas band is placed about the pipe prior to attaching rope sling used in raising and lowering of pipe and while the pipe is still suspended in the air over the trench it is carefully inspected and enamel applied by means of daubers where necessary before final lowering into trench. When an entire section has been lowered into the trench, and it is necessary to move the pipe a small distance longitudinally for aligning purposes either for a bell hold weld or Dresser application, this is accomplished by means of the Winch cable from one end of a truck. Fig. 9 shows the method of securing the other end of the truck while strain is on the cable.

One or more derrick trucks may also be used to advantage for endowing the pipe under existing water gas and other sub service pipes traversing the trench eliminating annoyance and temporary inconvenience to residents along the line and often resulting in construction economies.

Fig. 9.—Securing end of truck

Along a certain section of the route, the line is laid in the dirt wing of a macadam highway and a number of concrete paved side streets abut on this road, with concrete aprons extending several feet into the macadam highway. The permit issued by the local municipal authorities prohibited the cutting of these concrete aprons and necessitated in each instance offsetting the pipe about each apron as shown in Fig. 10. Offsets were also necessary at culverts as indicated in Fig. 11. All offsets are considered to be anchors (that is they prevent longitudinal movement of the line) and, therefore, Dresser Couplings are placed at each end of every offset. Sometimes sections of the line have to be laid and partially backfilled before welding is completed, in order that cross streets are closed to traffic for just as little time as possible and in such instances it is necessary to make a bell hole weld. The special fabricated fittings required for offsets and other purposes are for the most part laid out and welded along

side or adjacent to the trench and later lowered and welded or coupled into position.

A few welders, supplementary to the main crew, are assigned to the tie-in welds and the fabrication of special fittings. Hand trucks, each carrying a cylinder of dissolved acetylene and a cylinder of oxygen, are used to supply gases for these operations. One of these is shown in Fig. 12 where it is being used for making special elbows for an offset bend around the end of the concrete cross street seen in the background. The use of a template in laying out a cut for the fitting is shown in the same figure, as well as two complete elbows. Valves of the Venturi type are placed about every 2 miles, although provision for a valve is made every mile, consisting of two Dresser couplings and a 72-in. nipple. Bleeder or purge pipes are placed before every valve. These fittings are also welded in by the supplementary welding crew.

When a convenient length of pipe has been laid in the trench and tied in to the finished part of the line, and all fittings have been attached, it is tested by air pressure at about 100 lb. per sq. in. The joints are given a pressure-impact test by pounding the welds with a hammer of suitable size while under this pressure. They are next painted with soapy water in order to locate possible pin holes. Finally, the section must hold the pressure for 24 hours with no drop in pressure indicated on the recording gauge.

A new type of bull plug, designed by one of the crew on this job, is shown in Fig. 13. It is made up as follows: Square nuts are welded between two Dresser coupling collars and setscrews are inserted in the nuts as shown in the illustration. The setscrews are tightened up to hold this collar firmly to the pipe. A regular Dresser coupling with a short sleeve is made up between the two collars shown in the foreground, the collar at the end of the pipe having a circular plate welded into it. The setscrews prevent the bull plug from blowing off the end of the pipe during the pressure test. This type of fitting has been found to be very satisfactory for blanking off sections to be tested.

The backfilling machine follows up as soon as the pipe has been lowered into the trench, and the pipe is immediately covered except at the welds. Backfilling over the welds is not done until after completion of the air pressure test and painting of the joints. Only about 800 or 900 ft. is left uncovered at a time.

New lengths tied on the line are "gassed out" as soon as convenient; that is, the air is expelled from the line and gas turned into it.

INDEX NUMBERS

Index numbers are very helpful in all the major departments of management—sales, personnel, production, and finance.

Suppose that you, manager of the XYZ Company, wish to compare the growth, or the ups and downs, in your own business with those in the entire industry or trade in which you operate. Perhaps you wish merely to review the course of production yearly from 1913 to date. The accompanying table illustrates three possible index numbers, or series of simple relatives, which might be constructed from the *actual* production data in the first column.

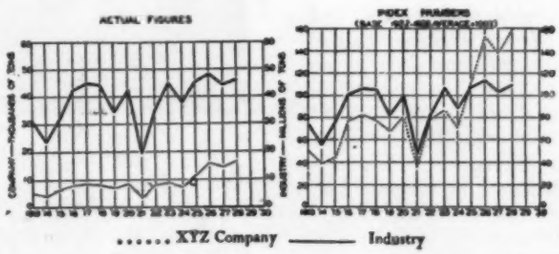
TABLE

SHOWING ACTUAL PRODUCTION BY YEARS AND INDEX NUMBERS THEREOF

YEAR	Actual Production (Thousands of Tons)		INDEX NUMBERS					
			On 1913 base as 100		On 1927 base as 100		On 1922-1926 base as 100	
	XYZ Co.	*Entire Industry*	*XYZ Co.*	*Entire Industry*	*XYZ Co.*	*Entire Industry*	*XYZ Co.*	*Entire Industry*
1913	5.2	31,300	100.0	100.0	36.4	70.8	50.3	73.8
1914	4.0	23,513	76.9	75.1	28.0	53.2	38.7	55.4
1915	6.3	32,151	120.2	102.7	43.7	72.7	44.4	75.8
1916	7.9	42,773	151.9	136.7	55.2	96.8	76.4	100.8
1917	8.5	45,060	163.5	144.0	59.4	101.9	82.2	106.2
1918	8.0	44,462	153.8	142.1	55.9	100.6	77.4	104.8
1919	7.0	34,671	134.6	110.8	49.0	78.4	67.7	81.7
1920	8.4	42,132	161.5	134.6	58.7	95.3	81.2	99.3
1921	3.6	19,783	69.2	63.2	25.2	44.7	34.8	46.6
1922	8.1	35,603	155.8	113.8	56.6	80.5	78.3	83.9
1923	9.0	44,943	173.1	143.6	62.9	101.7	87.0	105.9
1924	7.3	37,932	140.4	121.2	51.0	85.8	70.6	89.4
1925	11.5	45,394	221.2	145.0	80.4	102.7	111.2	107.0
1926	15.8	48,294	303.8	154.3	110.5	109.2	152.8	113.8
1927	14.3	44,214	275.0	141.3	100.0	100.0	138.3	104.2
1928 (Est.)	16.5		317.3		115.4		159.6	

The method is simply to divide each year's production by the production in the base period which you may think best. The base periods here used are (1) the year 1913, (2) the year 1927, and (3) the yearly average for the five years 1922-1926 inclusive.

Examination of the graphic chart will disclose some of the advantages. The upper half of the chart shows the *actual* course of production in both the XYZ Company (full line) and the industry as a whole (dotted line). Even when two different scales have been used (as here), it is often difficult to adapt the scales in such a way as to throw the two curves near enough together for effective comparison and study. Frequently the company curve may turn out to be a considerable distance above or below the other—a result which introduces certain difficulties for the eye and involves also certain technical difficulties.



Having chosen a base period suitable to whatever purpose the executive may have in mind, the curves are readily brought into each other's neighborhood by the index-number method. Then it is easy to answer such questions as the following: How does the long-time growth of our company show up in comparison with our industry as a whole? How much more, or less, did any given boom or depression affect us than it did the industry generally? And how does our recent position compare with that of the industry?

Executives Service Bulletin.

Some Phases of Public Utility Financing

By Philip G. Gossler,

President Columbia Gas & Electric Corporation

IN analyzing the business management of public utility companies, we must consider what are the underlying principles governing the business, to which all successful management policies must conform.

First and paramount, I should classify our public service obligations. We are organized for the purpose of supplying communication, light, heat, power and transportation facilities and services to the public at large. Generally, we operate under franchises or licenses from municipal or state authorities, that is, from the public itself, the rates and operations of such companies are, however, subject to regulation and control by state commissions or other public authorities, and have assumed the obligation of furnishing one or more of these classes of service adequately, reliably and at a fair and reasonable cost.

Second among these controlling management policies I would classify the maintenance of the credit of the corporation, because, without the ability to provide large sums of new capital at reasonable cost, the utility companies cannot possibly fulfill their service obligations.

Philip G. Gossler

Blank & Stoller

When you stop to consider the importance, in our everyday life throughout this country, and most particularly in the crowded metropolitan centers, of our telephone and telegraph service, for communication; of our electric supply for light and power, of our gas supply for economic and effective application of heat, and of our metropolitan transportation systems, it is easier to understand the responsibilities assumed by the companies in undertaking to provide these facilities and make these services available to meet every public demand for them. In every phase of our civic life, in the manufacturing plant, the factory, the office, the home, the church, the theatre, and in our movements between them our usual activities are dependent upon the ceaseless labor and product of the public utilities, any major interruption in which would practically paralyze all other activities.

It therefore does not take much further thought to realize that the growth and development of a community must be anticipated by the managements of the utility companies serving it, in order that their facilities may be adequate to take care of the increased growth as it develops, because their facilities can not be installed over night.

Now, why is the maintenance of the credit of public utility companies, to my mind, the next most important fundamental factor to service? There are two basic characteristics of public utility operations which do not apply to other business enterprises generally. First: the very large investment required in proportion to the annual income; and, Second, the essential requirement of continuous growth, which involves correspondingly increased investment from year to year which must be provided largely through new capital.

Taking these two characteristics up separately; it is necessary to understand in respect to the first that the relationship of capital to annual turnover is a most important consideration. If a business with a capital of say one million dollars, can obtain through its operations a gross income of one million dollars annually, it will be turning over its capital once each year, and if it can do this volume of business at a total cost of 80% of its gross earnings, or $800,000, it will have $200,000 net return on its capital of one million dollars, or 20%. If another company on a similar capital of one million dollars can realize two million dollars of gross earnings at the same ratio of expense, it would realize double the net earnings of a 40% return on its capital by a turnover of its capital twice each year instead of once. If

Abstract of an address before the School of Business, Columbia University, New York, Jan. 9, 1929.

on the other hand, another company can, with a capital of one million dollars, do a gross business of only $500,000 per year at the same ratio of expense, it would earn only a net return of 10% on its capital, because it would effect a turnover of its capital only once in two years. There are many lines of large business affairs where a turnover of capital can be effected from three to five times a year, and in some lines of business, many more times. Thus, it must be evident that the more rapid the turnover of capital in any business, the easier it becomes to realize a satisfactory rate of return on the capital employed, even at a lower percentage of margin between the gross earnings and the expenses of the business.

Capital Turnover Extremes

Public utilities (and railroads) are extreme examples among large business operations in this matter of capital turnover, as even the most efficiently managed public utilities average a turnover of their capital employed only once in each four to five years. This means that for each dollar of annual gross revenue received, the public utilities have from four to five dollars of capital invested. Or, in other words, in order to realize a return of 10% per annum on the capital employed, a public utility company must have a margin of 40% to 50% of its gross earnings left over after its operating expenses, whereas companies in other lines of business may realize, through frequent turnovers each year, an equal return on their capital through a net earning as low as 5% of gross, or less. This is a fundamental economic factor which cannot be materially altered. In each of the various lines of business enterprise the limitations of this factor must be recognized and accepted.

When we come to consider the second factor above referred to, the requirement of continuous growth, the comparison between public utility companies and other lines of business is no less striking. In many business enterprises the capital originally invested is the only direct outlay on the part of stockholders to begin the business and carry it on indefinitely in increasing volume and success. This is because the profits are sufficient to pay satisfactory cash dividends, and in addition provide such further capital as is required for expansion of the business from year to year.

In the case of Public Utility Companies, however, additional capital is a continuing requirement which never ends. This is due to several factors including, (*a*) the very large investment in proportion to gross revenue, as previously explained; (*b*) the constant enlargement of the service with the community growth and increased utilization of its service; and (*c*) the limitations placed by public authorities upon the charges for service, whereby they are restricted to necessary operating and maintenance expenses, plus a fair return upon the capital investment.

There are three forms of securities generally employed in public utility permanent capital operations, namely, Bonds, Preferred Stock and Common Stock. These different forms of securities are employed in order that the capital may be obtained from the various classes of investors on terms satisfactory to the investors and most advantageous to the companies.

Capital seeks that form of expression in the way of stock and bond issues that has the greatest market value. In endeavoring to procure capital this principle, which is ever at work, should not be underrated. The investor that is content with a low rate of interest but wants absolute security will take a bond bearing 4 per cent or 5 per cent interest, provided that there is back of his investment a large equity. The investor that desires a somewhat larger return but still is not willing to run a very great risk will buy a preferred stock entitled to 5 per cent, 6 per cent or 7 per cent preferential dividends, provided that there be some equity back of his investment, as evidenced by earnings in excess of the preferred dividend requirements. Finally, there is that class of investor who is willing to take a chance for larger profits. The saving that is due to the application of this principle of classification benefits the holder of the equity and belongs to him as a matter of right.

When a company issues Bonds it agrees to pay the owner of the Bonds back his principal, with interest in the meantime, and only after the interest has been earned is there any profit accruing to the stockholders. The stockholders are the owners of the company issuing the stock, whereas, the bond owner is in effect a lender of money to the Corporation issuing the Bonds. The owners, or stockholders, assume all the risks of the Bonds, in return for which they are entitled to the profits after paying whatever is due to the Bondholders for the money loaned by them.

Preferred stockholders are limited owners. To avoid the entire risks of the business, as taken by the common stockholders, they have foregone hope of increased profits if the enterprise is particularly successful, by agreeing to take a fixed dividend rate on their stock, and all profits after such charges belong to the common stockholders.

A Typical Example

Let us assume, for the purpose of illustration, a company with $10,000,000 of capital invested in its business, earning, after all its operating expenses, 8% on its value, or $800,000 in one year. If the entire capital has been provided by common stockholders, the entire $800,000 of net earnings belongs to the common stockholders and represents an 8% return on their investment.

If, however, $5,000,000 of the necessary capital had been borrowed by issuance of bonds bearing 5% interest, and the remaining $5,000,000 had been provided by common stockholders out of the $800,000 there would have to be paid interest on the bond issue, amounting to $250,000 per year, leaving $550,000 of net earnings available for the common stockholders as return on their $5,000,000 of investment, or an 11% per annum rate of return.

If we go one step further and, to obtain the original $10,000,000, borrow $3,000,000 through the issuance of Stocks, and only raise $4,000,000 from the common 4% bonds, raise another $3,000,000 by selling 6% preferred stock and only raise $4,000,000 from the common stockholders, then the same $800,000 of net earnings would pay the interest on the bonds and the 6% dividends on the Preferred Stock, and still provide $500,000 per year return for the common stockholders, who in this case had invested only $4,000,000, so they would be receiving an annual return of 12½%.

In this, perhaps, elementary outline of the distinction between the various types of securities customarily used in corporate finance, I have tried to make clear that first the lenders of money, and second the preferred stockholders, have been willing to take a limited income on

the capital they put into the enterprise in return for a greater assurance of that income and security of principal than is enjoyed by the holders of securities behind them.

Thus the very essence of the bond issues with their relatively low rate of income, meaning low cost of money to the company, is the higher relative security of the investor in this class as compared to the junior securities of the same company.

However, in the early days in each branch of the public utility industry, they were all very new and untried undertakings, and the inherent risks of the business in each case were very great. Therefore, while there were aggregate amounts of capital willing to take this risk and take common stock in the various companies entering the public utility field, they were not large enough to provide all the capital required, and therefore borrowing had to be resorted to. However, because the industry had not demonstrated established earning power and permanency, lenders of money were not readily willing to take the bonds with their limited income rate and, therefore, as further inducement to them, it was customary back in those days to promise them a share in the future of the company, if successful, through some common stock ownership without all the risk commensurate to the entire investment in that common stock. Thus the purchaser of a bond in those days ordinarily got, for the price he paid for his bond, some common stock interest in addition and it is the stock so issued which has since been referred to by many critics as "watered stock" in each public utility industry, meaning, thereby, stock issued without apparently commensurate value having been paid to the corporation.

Only on a limited and strictly technical sense can stock so issued be called "watered stock." It is true that there was not paid into the corporation, as consideration for the issuance of such stock, the sum of money equal to the so-called "par value" of the stock. But there was a real consideration paid to the corporation for the issuance of that stock, namely, without that inducement as additional incentive, bankers and investors would not have purchased the bonds and there would not have been forthcoming the amount of capital necessary to develop this great industry.

Effect of "Watered Stock"

In effect, the issuance of this so-called "watered stock" was capitalization of anticipated future earnings, and in most cases subsequent developments have justified the expectation. As the companies have become successful and their earning power has been established, the earnings have been reinvested in the properties and have established real asset values for this stock, and this process is known as "squeezing the water out" of the stock.

Until recently it has been almost universal, and still is quite common, for corporations to state that each share of their stock is of a certain par value, usually $100 per share, but often $50, 25, $10, or even $1 per share. The amount is immaterial—the principle is the same.

The intent was to indicate what consideration had been paid for the stock, and in most cases it is illegal to issue stock for a consideration less than its par value. The consideration may be paid in cash, or property, or in some cases services to a reasonable extent.

Par value also serves to indicate on the balance sheet of the company what the invested capital of the stockholders of the corporation is, as opposed to its additional value represented by accumulated earnings.

However, in the final analysis a share of stock represents only a proportionate part of the ownership of the enterprise, and its real value depends on the realizable value of the assets of the corporation in excess of its obligations and liabilities, together with the value of its earning power, and this real value of the stock has no necessary relation to its par value from the time that it begins operations.

Therefore, this proportionate ownership can just as well be represented by a share of stock without par value, which merely states that it is a proportionate share in the ownership of the property. That this kind of stock has advantages over the older form, is evidenced in the ever increasing number of corporations issuing stock without par value.

Advantages of Proportionate Ownership

Some of these advantages are, that because there is no figure of value appearing on the stock certificate, a holder of the stock or a prospective purchaser thereof is almost forced to look into and give consideration to other elements indicating its real value. Furthermore, it facilitates the financing of the corporation in that stock without par value can be issued at such prices as the Directors of the company determine in conformity with the facts and financial conditions at the moment. As for defining on the balance sheet, the amount of capital of the corporation, that is accomplished with no-par-value stock as easily as with par value stock by stating, as capital, the value to the corporation of the consideration for which its stock was issued.

If no-par-value stocks had been availed of in the early days of the public utility industry there never would have been this criticism of "watered stock," because it is immaterial whether 100,000 or 1,000,000 shares were issued in the purchase of a specific piece of property or to raise a specific amount of money. The value of these shares depended on the use made of the property or money and its earning power as proven, and had nothing to do with any stated par value which did appear on the stock certificates.

There is now invested by the Public Utility companies of this country, not including railroads, an aggregate sum of twenty-five billions of dollars, which is increasing each year. If the obtaining of this fabulous amount of new capital were primarily for the benefit of the public utility companies themselves, in order to extend their business, and profits for their stockholders, the general public, or at least those who are not interested as investors in such properties, might seem to have no great interest in the matter. It should be borne in mind, however, that the entire public is most vitally interested in the adequacy and efficiency of public utility operations throughout the country, since the continued growth and welfare of every community is dependent to a very large extent upon the character and extent of the public utility operations.

Selling the Customers

It has become quite general practice in public utility companies, particularly in the electric industry, to raise a portion of the new capital funds they always need by selling, to the customers they serve, the Preferred Stock —and in some cases Common Stock—of the operating

company from which such customers buy their service. This has proven to be an exceedingly sound economic practice.

The volume of the sale of securities to customers has been as much as one-third of the total new capital requirements for electric light and power companies throughout the country in certain years, and is apparently being maintained. For your information, the following are the "Ten Cardinal Principles" governing the issuance and sale of securities to customers as enunciated by the Customer Ownership Committee of the National Electric Light Association.

1. The sale of the securities must be direct from company to customer, or through an agency expressly created for the purpose and controlled by the company.
2. The safety of the securities offered must be amply protected by property and earnings.
3. A minimum rate of dividends must be provided for in so far as honest judgment based on experience can foresee.
4. A reliable resale market must be maintained in some manner so that shareholders who wish to dispose of their holdings can do so promptly at nominal expense.
5. A partial payment purchase plan must be operative in order to give every customer who can save a small amount monthly full opportunity to become a shareholder and to encourage thrift.
6. The proprietary interest and responsibility of shareholders must be emphasized and the shareholders supplied regularly with information regarding their company and its affairs.
7. Loss of capital by shareholders in hazardous and fraudulent offerings from various sources must be guarded against by the rendering of authentic information and advice to shareholders.
8. The number of shareholders must be increased steadily, and efforts should be made to avoid large individual accumulations of stock.
9. Employees must be carefully instructed in order that all representations made to customers or others are in line with the facts.
10. Managements must realize that customer ownership multiplies their obligations to the public and intensifies the trust reposed in them. It does not replace the constant striving for higher efficiency, good service, reasonable rates, courtesy and progressive public relations policies.

Contribution of Holding Companies

Prominent among the factors that have contributed to the rapid and healthy growth of the utility industry has been the so called holding Companies. With the development of engineering skill and improved mechanical equipment, great advance has been made in the efficient production of electric energy and gas, in large quantities, and in their transmission over long distances over wires or through pipe lines. All this has tended to development of larger and larger units of both gas and electric production. As these production units have exceeded in capacity the demands of the community in which they are located, it has been possible to extend the transmission of their product, and many of these big producing units have been inter-connected into large systems, providing flexible supplies of power and heat over vast areas. The financing required for such large developments has, however, far exceeded the resources of the cities and communities supplied, and recourse therefore had to be taken to the principal money markets of the country and the world, and to collect and invest capital in such large aggregate sums has necessitated concentration of management and engineering abilities and financial resources. This need has been provided adequately by the Holding Companies.

A simple description of the holding company as so developed is a company which owns the stocks of individual operating companies rendering one or more public utility services, each in a specific locality. The holding company customarily provides for the operating companies, management and engineering advice and supervision of a character which no one of the individual companies alone could afford to employ, but which in an advisory capacity is capable of supervising the policies and problems of a great number of such individual companies. Furthermore, the holding company has provided capital in an amount far in excess of what the individual companies themselves could have raised at the same or even at a higher cost than that which the holding company has experienced. This alone justifies their existence.

Columbia's Experience

A particularly interesting example of the results which can be accomplished by recapitalization of a Corporation and refinancing under advantageous financial conditions, is afforded by an examination of what Columbia Gas & Electric Corporation and its subsidiaries have done in the past two years.

Columbia Gas & Electric Corporation was formed by a merger of two large Utility Systems late in the year 1926, and controls the Common Stocks of many operating subsidiary companies, some of which have Bonds and Preferred Stocks in the hands of the public.

During the two years following that merger a considerable number of Bond issues have been redeemed through financing provided by an issue of long-term Debenture Bonds of the Columbia Corporation itself. Also, some of the subsidiary companies have been recapitalized and their issues of Bonds consolidated into new issues bearing lower coupon rates, and in the same way some of the Preferred Stocks have been replaced by lower dividend rate stocks. The net result is that during this two year period the number of issues of Bonds and Preferred Stocks taking precedence over the Common Stock of the Corporation, has been reduced from 44 to 29, a net reduction of 15 issues, and the amount of securities of subsidiaries in the hands of the public has been reduced from approximately $149,900,000 to about $115,400,000 a net reduction of about $34,500,000.

At the same time, additional properties have been acquired and additional capital raised for expansion of both the old and new properties. In thus expanding, the total outstanding securities of the Corporation and its subsidiaries have increased from $338,600,000 to $382,700,000, an increase of $44,100,000.

The refunding operations included an issue of $35,000,000 4% First Mortgage bonds of a subsidiary Company which were sold to the public on a 4.40 per cent basis, and these refunding operations were so large and involved such a reduction in fixed charges that the an-

nual interest charges and Preferred dividends, were reduced by a sum equal to $2,885,000 per year, which is directly reflected in the increased earning power of the Common Stock.

During this same period of about two years in addition to the new capital provided through the security issues mentioned, more than $18,000,000 has been reinvested in the property from the earnings over and above the cash paid out for operating expenses and disbursed in interest and dividends.

Plan Now for Future Domestic Sales

Facts and figures show the fore sight of a Texas gas company and its influence in marketing gas appliances

By S. M. Apperson
Commercial Manager, Austin Gas Company

IT IS a wise Commercial Department that will plan several months ahead and follow up such plans with vigorous selling efforts. Such a scheme of affairs cannot but be productive of mighty near all the desirable appliance sales that a company can expeditiously handle. And, in passing, it should be stated that certain appliances and equipment CAN be sold considerably in advance of the time of the year in which they find their most active use. At least this has been the recent experience in the city of Austin.

With a population of approximately fifty thousand Austin has in service 5600 domestic meters. The number of water heaters in use total 2905 and of these, 1900 are of the automatic instantaneous and automatic storage type. The balance are of the old side-arm and old nickel-plated instantaneous types. Incidentally, beginning with the first of the year 1928 it was the intention of the Austin Gas Company to replace, in the space of two years, the thousand antiquated water heaters with automatic or storage units. Accordingly, a determined start was made and

Inviting display floor of Austin, Texas, Gas Company

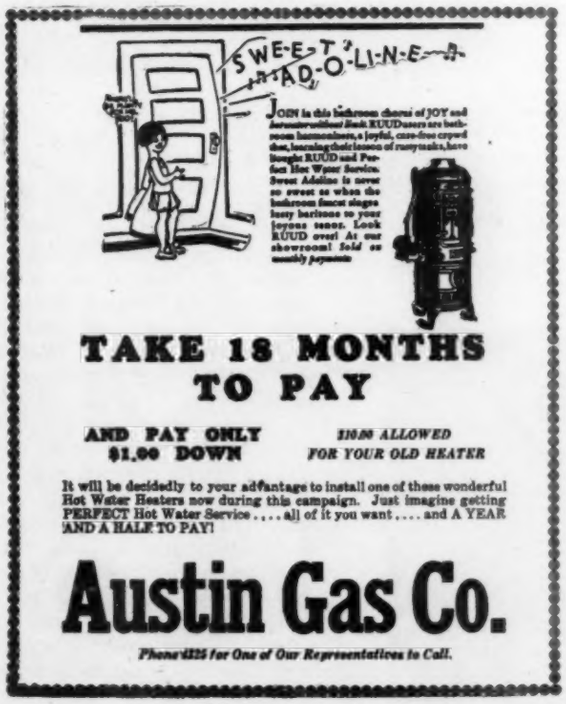
some of the results might be worth calling attention to.

During the first four months of last year one hundred and twenty-four water heaters were sold and, during one very intensive campaign in March, sixty-three water heaters were installed. Incidentally, all of these sales efforts were mapped out a number of months in advance of the actual time of selling.

Feeling the Community Pulse

A novel idea was used during the last week of this sale. The Austin Gas Company cooperated with some of the civic clubs of the city in sending the Austin High School basket ball team, the Texas state champions, to the National tournament at Chicago. The scheme was worked out as follows: The last week of the sale the Austin Gas Company gave to the high school team four dollars on every water heater sold, irrespective of where or how it was sold. Twenty-three units went to credit four dollars each to the basket ball team.

The local newspapers furnished very good editorial publicity and the sporting editors adopted the Gas Company's slogan, 'On to Chicago,' which the company in turn used for advertising purposes. Such 'stunts', so to speak, are considered legitimate and worth while.

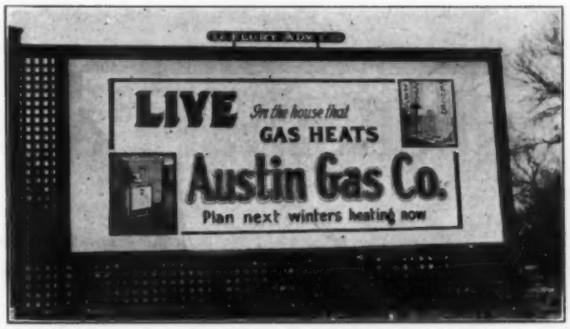

SWEET ADO-LI-N-E
TAKE 18 MONTHS TO PAY
AND PAY ONLY $1.00 DOWN
$10.00 ALLOWED FOR YOUR OLD HEATER
It will be decidedly to your advantage to install one of these wonderful Hot Water Heaters now during this campaign. Just imagine getting PERFECT Hot Water Service .... all of it you want .... and A YEAR AND A HALF TO PAY!
Austin Gas Co.
Phone 4225 for One of Our Representatives to Call.

"Peppy" Newspaper Advertising

It is a backward looking policy to consider that a particular appliance can only be sold at a certain time of the year. As a matter of fact the Austin company sold during July, 1926, thirty-six automatic heaters. And July is an extremely hot month in Texas, with the public giving ordinarily but little thought to the purchase of such equipment.

During the month in question the sales idea and argument were based on the need of the hot water in the kitchen and the lightening of the housewives' work.

The first of the year the company, with six salesmen, set their goal at three hundred heaters for 1928. This figure was too low as 315 water heaters were sold.



Excellent use of billboards

As regards appliances for heating the home the company pursues the same policy as applies in the case of ranges and water heaters. And it must be remembered that although Austin is situated rather far south, still there are many days during the winter, when a Nor'wester sweeps down from the Panhandle, that heavy overcoats are worn.

On June 1st, 1928, the company started a campaign on house heating, the first ever attempted in the summer, and up to July 10th, had sold the following gas fired heating equipment:

a—198 Radiantfire Heaters
b— 11 Gas Steam Radiators
c— 33 Furnace Burners
d— 11 Floor Furnaces
e— 5 Heatrolas

Up to the middle of August the Radiantfire Heaters had been increased by 143, furnace burners had jumped to a total of 67, Gas Steam Radiators added 7 units, Heatrolas 3, Floor Furnaces 9, and in addition, 7 Gas Fired furnaces had been sold.

Worthwhile Sales Results

The company has experienced no trouble whatsoever in inducing its customers to install heating equipment well in advance of the season when it will be used. Incidentally, during the sale of such appliances and equipment other appliance sales held up well, range sales totalling for the year 487, and automatic water heaters 185.

The following tabulation shows the total appliances sold during 1928 as well as other pertinent data.

Ranges	725
Water Heaters	315
Space Heaters	1425
(1175 of which were Radiantfires)	
Radiantfire Heaters sold throughout July, August and September	400
Furnace Conversion burners	146
Heatrolas	26
Gas Radiators	89
Floor Furnaces	23
Gas Fired Furnaces	14
New Services	733
Increase in Meters	1046

Total estimated annual increase in consumption, including Domestic and Industrial	920,000,000
Industrial consumers signed up	44
Total Gross Sales	$188,000.00
(This gives a sale of $28.92 per meter for the year)	

The Austin Gas Company has raised its sights for 1929 and are going after a $200,000.00 business. It gets results by planning ahead, instructing the salesmen and public in what they are selling and putting in a lot of hard work.

Substantial Pegs on Which to Hang New Business

By F. Y. Yeatman

THE Annual Forecast of Building Construction for 1929 issued by the Architectural Forum estimates that almost $7,500,000 will be spent for the erection of buildings of various kinds during the current year. The distribution of such construction expenditures is given herewith:

North Atlantic States	38%
North Eastern States	5%
South Eastern States	3%
South Western States	7%
Middle States	35%
Western States	12%

An estimate of the number and character of new buildings to be erected is shown by the following tabulation:

	Total	*On gas lines*[1]
Homes (one and two family)	672,500	500,000
Apartment Houses	30,700	28,000
Churches	2,080	1,500
Hotels and Lodging Houses	655	600
Amusement Buildings	1,605	1,500
Factories and Workshops	8,360	7,500
Public Garages	7,850	6,000
Private Garages	425,000	350,000
Service Stations	9,200	5,500
Institutions	490	400
Office and Public Buildings	3,500	3,200
Schools and Libraries	2,050	1,500
Stores and Warehouses	27,150	21,000

[1] Estimated by F. Y. Yeatman.

From the above figures a basis can be derived for making a conservative estimate of the new business in gas appliances possible to be obtained by the Gas Industry of this country in 1929. The tabulations are shown herewith:

Kind of Building	Ranges	Water Heaters	House Heating Plants	Laundry Dryers	Garage Heaters	Space Heaters	Incinerators	Refrigerators
Homes	500,000	500,000	150,000	150,000		300,000	150,000	150,000
Apartment Houses	140,000	28,000	28,000				28,000	100,000
Hotels	1,200	600	300	300			300	600
Amusement Buildings		1,500	1,000			1,000		
Churches	1,000	1,000	800			500		
Factories		7,500						
Public Garages		6,000	3,000			3,000		
Private Garages					200,000			
Service Stations						5,000		
Institutions	600	500	300	300			300	300
Office and Public Buildings		3,200	1,000					
Schools and Libraries	150	1,500	800					
Stores and Warehouses		20,000				15,000		

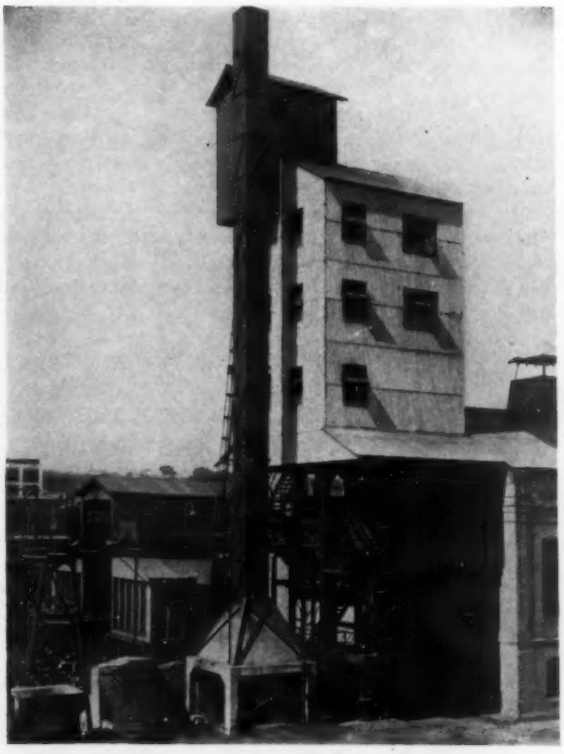
THE SMALL FACTORY

Again is the sun rising upon the small factory after an era during which the huge industrial plant flourished, according to E. W. McCullough, Manager of the Department of Manufacture of the Chamber of Commerce of the United States.

"There is no passing of the small factory equipped with modern machinery and strategically located," he said in an address before the Findlay, Ohio, Chamber of Commerce.

"The day of the big, inflexible plant, facing intense competition in distribution as well as production, seems to be on the wane. The cry that the big fish are eating the little ones sounds less alarming. Already many of the newer and best managed industries are getting away from building very large units and leaning more strongly toward those commensurate with the market to be served and building them near it."

U. G. I. Vertical Chamber Oven Plant at Dubuque Iowa, Now in Operation

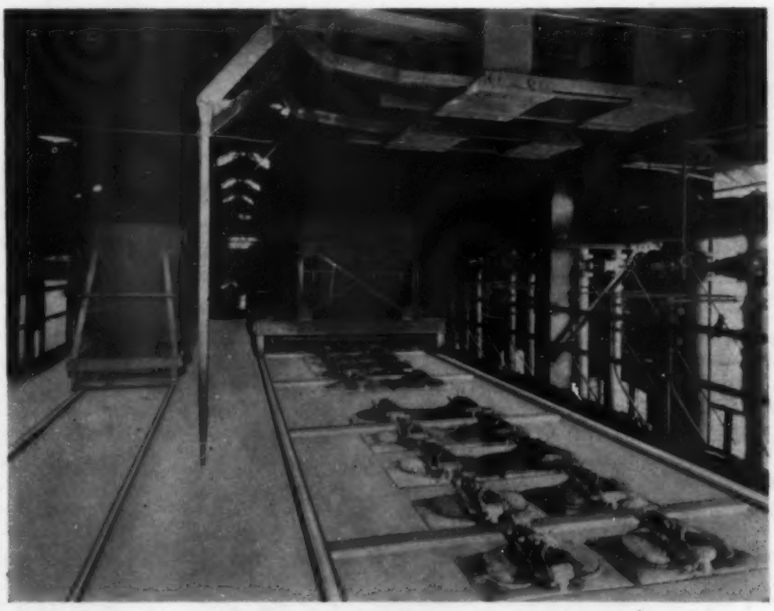


U. G. I. Vertical Chamber Ovens at Dubuque

AFTER a thorough study by U. G. I. engineers of bulk carbonization systems in Germany, the home of coal carbonization, the intermittent chamber gas oven of the Stettiner Chamotte-Fabrick Aktien Gesellshaft was chosen as the system best adapted for this country to give bulk carbonization in a plant fundamentally designed for gas works practice and proven through years of operation essentially as a satisfactory oven, with coke as a by-product. The Stettiner Company is the largest carbonizing plant builder in the world and has dominated the carbonizing business in Germany for over thirty years. They have made about 270 installations in Germany comprising about 3500 ovens, the first installation having been placed in operation in 1918 with a continually increasing number being installed each year.

Three U. G. I. intermittent vertical-chamber oven plants of this type are now in operation, at Dubuque and Clinton, Iowa, and Racine, Wisconsin. The first one installed in this country was placed in operation at Dubuque, in August of 1928, and was turned over to the local company early in October. This plant, built by The U. G. I. Contracting Company division of United Engineers & Constructors Inc., for the Key City Gas Company, consists of three benches each of five type "S" vertical-chamber ovens with attached producers, charging larry and hot coke car.

Coal, coke and breeze bins are located in the upper portion of the oven structure. The waste gases are conducted to the atmosphere by a radial brick chimney. The coke is cooled in a coke quenching tower and the steam resulting from the quenching is discharged above the top of the oven structure. A U. G. I. horizontal waste-heat boiler produces steam from the sensible heat of the waste gases from the setting. This boiler is equipped with automatic feed regulation so that its operation requires very little attention.



Charging floor of Dubuque Ovens

A draft fan provided with the boiler installation pulls the gases through the boiler and discharges them into the stack.

Coal and coke handling equipment has been installed, the coal being received from railroad siding into a track hopper, then fed to a crusher, where it is crushed to the proper size for use in the ovens, and elevated by a skip hoist to the coal bins above the oven setting. The hot coke is dropped from the ovens into a hot coke car, this car being then directed under the coke quenching tower where the coke is quenched and delivered to the coke screening plant to be sized and screened for the domestic trade.

The carbonizing plant is operated by two men per shift. The results which have been secured on the operation of the plant are very satisfactory. Elkhorn 2" modified run-of-mine coal is used and the ovens steamed to give a 560 B.t.u. gas. The ability to steam the ovens makes for flexible and simple operation. The results of operation which are given below were secured during the period of operation by the U. G. I. engineers and before the plant was turned over to the local company.

	Results in August, 1928 (no steaming)	Results in September, 1928 (with steaming)
Corrected gas made per 24 hours—(cu. ft.)	637,000	692,000
Moisture in coal as charged—(per cent)	3.97	2.15
Carbonizing time — (hours)	12	12
Corrected gas made per lb. dry coal—(cu. ft.)	6.00	6.42
Calorific value (B.t.u. per cu. ft.)	573	560
B.t.u. in gas per lb. dry coal	3438	3595
Dry producer fuel per ton coal charged——(lbs.)	241	226.4

Coal, Coke and Gas Analysis for September
(Average of Daily Analysis)

Coal		Coke	Gas	
Moisture	1.35	0.55	CO^2	2.1
Ash	3.92	5.07	Illuminants	3.4
Vol. Matter	36.97	1.93	O^2	0.4
Fix. Carb.	57.76	92.45	CO	13.5
			H^2	51.9
			CH^4	24.3
			N^2	4.4
	100.00	100.00		100.0

The above results demonstrate the high efficiency of the U. G. I. vertical-chamber ovens in even the small plants. The operating results at Clinton, Iowa, and Racine, Wisconsin, are equally good and as soon as a sufficient period of operation is secured they will also be published.

The U. G. I. intermittent chamber gas oven provides a carbonization system offering the following advantages:

1. A gas oven designed for manufacture of gas, with coke as a by-product.
2. High capacity per square foot of ground space.
3. Low Labor cost due to: (a) Simplicity of regulation; (b) No moving machinery except charging larry and hot coke car; (c) Production of domestic coke of highest quality; (d) Small amount of coke breeze made.
4. Low maintenance cost due to: (a) Low operating temperatures; (b) Practically no moving machinery; (c) Simple, uniform and easily regulated heating system; (d) Rugged construction.
5. Efficient operation due to: (a) Steaming, giving dilution without addition of inerts; (b) Flexibility of operation with coal gas heating; (c) High gas yields; (d) High by-product yields; (e) No naphthalene made.

DIVISION OF GAS AND PETROLEUM OF THE STATE OF CALIFORNIA

The Divison of Gas and Petroleum of the State of California is the newest division of the Department of Natural Resources, and concerns what is both one of the newest and one of the largest of California's industries. The production of natural gas and petroleum products, amounts in value to more than two hundred and eighty million dollars a year. During the past few years the industry has been immensely stimulated by the discovery of deep oil sands and the discovery of new oil producing areas.

The bringing in of these new wells has caused a great wastage of natural gas, and a year ago a committee was appointed, headed by the Director of the Department of Natural Resources, to confer with leading operators of the oil industry with a view to reducing wastage as much as possible. As a result of recommendations, field committees were formed of production superintendents and engineers to study the problem as it applied to each particular field. Although the results have been far from satisfactory, owing to the rapid development of the industry and the large number of new wells, at the same time there has been a gratifying response on the part of the operators, all of whom evidently realize the economic loss through a production of oil in excess of market need and industrial requirements, and especially through the loss of gas which, when once blown off into the air, can never be recovered.

Through the efforts of this conservation committee some gas has been shut in, some has been restored to depleted zones underground, there to remain for future use, and some has gone to the repressuring of producing oil sands, thus increasing the ultimate recovery of oil. There has also been a considerable extension of service of natural gas for domestic and industrial uses. The latest development of this nature is the investment of millions of dollars for the laying of a gas carrying pipe line, connecting the Ventura and Kern County natural gas producing areas with the Metropolitan markets around San Francisco Bay. The methods of dealing with the gas surplus problem have met with approval both from the oil operators and from the public, and should be encouraged. The experience gained and the results attained through cooperative management of oil and gas producing operations in a given field, under the direction and management of those interested, warrant the suggestion that legal sanction be given to this procedure.

Again the Question-What Price Ammonia?

Complications of this Problem Evident from Comment of three Engineers

Three well known engineers comment below on the problem of getting the maximum return from ammonia in the moderate-sized coal-gas works. Their remarks, which are well worthy of careful study, show that there is no easy road to the best plan; they also again emphasize the large variation in conclusions which will be reached according to the methods of cost allocation chosen. The question of capital charges against by-products is one causing perrennial controversy. But however it may be settled, the management must face the fact of the existence of such "overhead" items, because they are just as real as items of operating expense—Editor.

Comments of John S. Unger

Editor, American Gas Journal:

Mr. W. I. Battin in his comment in the December journal on Mr. A. M. Beebee's article, "What Price Ammonia," furnishes figures on the cost of producing a concentrated gas liquor that I take the opportunity to question.

In order to compare the production costs of sulphate and concentrate from 800 tons of coal per day, Mr. Battin states that he uses Mr. Beebee's figures for labor, steam and lime. The cost of labor seems reasonable in both cases, $32.40 per day for sulphate and $13.82 for concentrate. Mr. Battin figures on a yield of 5 pounds ammonia per ton of coal, whereas Mr. Beebee's yield is 5.55 pounds and it may be questioned whether the recovery of ammonia in the form of a concentrate is less efficient than a semi-direct sulphate recovery, but in the following I have used Mr. Battin's figure of 4,000 lbs. per day.

Unit Steam Cost Not Stated

Mr. Battin does not state the unit cost of steam, nor how he obtains his cost of 0.932 cent per pound of ammonia, but assuming that the weak liquor is 1.5%, or 40 gallons per ton of coal, the steam consumption for the operation of the still should not exceed 2.33 lbs. per gallon, or about 18.5 lbs. per pound of ammonia and his unit cost would figure to about 50 cents per 1,000 lbs. of steam. This cost may be correct in the case that he had under consideration, but where the steam is generated from coke breeze or from waste heat, the cost should be less and at most works, there would be exhaust steam available for the running of the still and so I would say that his figures for steam are too high and could be reduced by one-half.

His figures for lime are about twice Mr. Beebee's figures, 0.632 cent to Mr. Beebee's 0.3 cent, ($1.50 per ton of sulphate) and assuming that 0.5 lb. lime is used per pound of ammonia, Mr. Battin's lime would cost 1.26 cent per pound, or about twice the usual price of lime.

Therefore, it seems to me that Mr. Battin's conclusion that in his case the ammonia in the concentrate must sell for 4.9 cents per pound, in order to cover the manufacturing expenses, would apply to exceptional cases only, and is erroneous in a general sense on account of his charge for the upkeep and interest on the gas scrubbing equipment.

Mr. Beebee and Mr. Battin both come to the conclusion that under existing prices, there is no money in the ammonia recovery at gas works. The question is, what are they going to do about it? The ammonia must be eliminated from the gas and the equipment required for scrubbing the gas with water or treating it with sulphuric acid would be parts of the gas manufacturing apparatus and to charge it to the ammonia recovery is neither fair nor reasonable.

Fears Groundless

From such a point of view, the gas men need not fear that the synthetic ammonia people can beat them in the cost of production. In order to meet the competition, the methods of manufacture will have to be improved upon and this can be done, easily, in the case of a concentrate, by the installation of equipment for eliminating 80 to 90% of the impurities in the liquor, whereby the liquor is preheated in a separate still before it is made into a concentrate, with no additional labor expense, with an additional expense of one-third more steam, but with a saving for freight, in case the concentrate is to be shipped for a distance, because a stronger concentrate can be produced without troubles from salting.

The better the concentrate, the more use will be found for it and it seems reasonable to predict that ammonia will continue to be recovered from coal gas, in spite of any improvements that may be made in producing it by synthetic methods.

JOHN S. UNGER.

Battin's Observations

Editor, American Gas Journal:

I want to thank you for sending Mr. Unger's letter to me. I am glad to have so good an authority on ammonia concentration as Mr. Unger comment on my letter although I do not feel that my figures should be changed. You see I used the same prices for materials and labor as I calculated to have been used by Mr. Beebee and if the prices I used are too high then Mr. Beebee's costs for sulphate would likewise have to be reduced. Or again if exhaust steam can be used for the still in the one case it can be used in the other, etc.

Bituminous

Reliable information from practical operation of water-gas sets with bituminous coal summarized from reports of twelve companies by W. J. Murdock, D

Presented at 1928 A. G. A.

	QUESTIONS — COMPANY →	I.	II.	III.	IV.	V. (b)
1	Specifications as to Sizing of Generator Coal at the Mines	(a)	6" Egg	2" x 4"	Not Less Than 2½" Lump	6" x 4" Or 4" Lump
2	Percent of Fines Removed From Coal as Received from Mines	Fines Below ¾"	Not Known	All Fines	4%	4%—8%
3	System Is Used In Handling Coal From Railroad Cars or Storage to Generators?	Belt Conveyor	Locomotive Crane and Clan-Shell Bucket	Side Operated Push Cart	With Hand Forks Into Buggies	Varies; Generally Cone Shaped 2-Wheel Buggies
4	Breakage in the Plant Handling System	Slight Breakage With Bins Full	Not Known	(a)	Additional 2%	High If Elev. and Hopper Used
5	Results of Screening Test of Fuel Entering Generator	(a)	25% Fines	(a)	None Made	None Made
6	How Coal Charged to Generators? To What Level Is Fuel Charged?	Mechanical Charger Well Above Offtake	Coal Spreader 1' Below Offtake	Long Handle Shovels Level With Offtake	Shovel Into William-son Set; Buggies To 3 Shell Set	Spreader Level With Offtake
7	How Often Are Generators Charged?	Every Run	6 Runs	8 Runs	72 Min. Large 32 Min. Small	5—8 Runs, Or Approx. 30 Min.
8	Average Weight of the Charge?	250 Lbs.	1050 Lbs.	1950 Lbs.	5500 Lbs. On 12" Set 600 On 6' Set	Varies With Set Often Light
9	How "Arching Over" or "Bridging" in Generators is Overcome?	Barring Down	Barring Down	Barring Down	Condition Not Noted	1—2 Straight Runs After Charging
10	How Are Blow Holes Treated?	Bar Down and Fresh Fuel	Large Set Barred Small Set Fresh Fuel	Barring Out	Filled With Coal	No Real Trouble On Small Set
11	Normal Appearance of Fire Just Prior to Coaling	Black on Top Dull Red In Active Portion	Fuel Small; Fire Level; Uneven Large Holes	Usually Spotted Dead Eyes and Clinker	Dull Red After Down Run	Very Good if Proper Blast Rate and Doughnut Plate On Grates
12	Is the Fuel Bed Leveled Off Prior to Every Charge? Why?	No.	No.	No.	No.	Holes Filled Good Practice On Large Sets
13	Normal Blast Pressure Under Grates	23"	18"—22"	17"	36" Large Set 16" Small Set	28"—30"
14	Air Used Per M of Gas Made:— (a) Generator Air? (b) Carburetter Air?	(a) 900 (b) Sufficient	(a) 1200 (b) Do Not Know	(a) (b)	Not Determined	(a) 1150—1350 (b) (a)
15	Is Carburetter Air Valve Opened Simultaneously With Stack? Reasons?	Yes; To Clear Stack	No; Insufficient Hot Gas To Light Off	No; Shortly Thereafter	Yes. When Necessary To Prevent Smoke	Yes; Eliminates Smoke and Easier To Light
16	How Is Smoke Production Minimized?	Quick Opening Carburetter	15 Sec. Blow Run Before Coaling	Blow Run Immediately After Charging	Same As Question No. 15	Frequent Light Charge, Large Fuel Min. Fuel, Tertiary Air
17	Percentage of Fuel Reclaimed As Blown Over Material	Not Known	8%	5—6%	10% On 12" Set 5% On Small Set	Very Small
18	Pounds of Fuel Removed from Stack Dust Collection Per Ton of Coal Fired	90 Lbs.	Have None	(a)	Not Determined	Not Known
19	Steam Used Per M of Gas Produced	35 Lbs.	40 Lbs.	(a)	40 Lbs. If Possible	Uncertain
20	Necessary to Use More Steam Per M With Coal Than With Coke? Why?	Uncertain	Yes; Coal Allows Undecomposed Steam To Pass Thru Gen.	No (a)	No (a)	No (a)
21	What Operating Cycle Is Used? Give the various Steps in Both Percent and Seconds	4 Min. Cycle Blow 30% 72 Sec. First Up Run 30% 72 Sec. Back Run 38% 91 Sec. Last Up Run 2% 5 Sec.	4 Min. Cycle Blow—34% Run — 66%	7 Min. Cycle Blow—3 Min. Run — 4 Min. Alternate Up and Down	6 Min. Cycle Blow 39.8% Blow Run 8.3% Steam Run 50.0% Purge 1.9%	3½ To 7 Min. Cycle Blow 33.3—45.6% Blow Run 0—3.0% First Up Run 9.6—26.2% Down Run 24.0—39.0% Last Up Run 2.4—20.0% Purge 1.0—2.6%

nous Water Gas

. Murdock, District Manager, Western United Gas and Electric Company, Aurora, Illinois, and Chairman, Water-Gas Committee of American Gas Association.

1928 A. G. A. Production Conference.

. (b)	VI	VII	VIII	IX	X.	XI	XII (c)
x 4" Or Lump	4" x 6" Egg	3" x 6" Lump	4" x 6" Egg Kentucky	3" x 6"	3" x 6" Lump	3" x 6" With Shaker Screen	6" x 3" Lump Illinois Coal
—8%	Not Known	10%	13% Under 1¾"	None	10—20%	10%	3%
Generally Shaped el Buggies	Overhead Track, Skiphoist To Bin Over Screen To Larry	Elevated Trestle to Dump Forked To Buggies	Cars to Conveyor To Grizzly 1⅜"x1" to Bunkers By Shuttle Belt	Crane To Storage Bucket Elev. to Bins, Chutes to Buggy	Cars to Works Via Motor Trucks From Boats Via Crane	Track Hopper, Screen Derrick to Bunker Thru Screen to Buggy	Track Hopper, Conveyor, Over Screen, Bunker, Larry
Elev. and er Used	25%	Not Known	2% Under ¾"	15%—20%	5%—7%	2%	Minimum
e Made	None Made	None Made	On 2¼" Fork—62% Thru 2¼" and On 1¼"—26% Thru 1¼" Fork—12%	None Made	None Made	None Made	None of Recent Date
der Level Offtake	Monorail Hopper Level With Offtake	Buggies Level With Offtake	Larry to Screen With Spreader Full As Possible	Larry With Spreader 1 Foot Below Offtake	Larry Bottom of Offtake	Larry and Special Chute Well Up In Conical Part of Lining	Larry To Special Design Spreader; Full & Well Above Offtake
Runs, Or 30 Min.	5—6 Runs	6 Runs	11 Runs	10 Runs (40 Min.)	5—6 Runs	40 Min.	10—12 Runs
With Set Light	1000—1200 Lbs.	3000 Lbs.	3200 Lbs.	1600 Lbs.	2000—2500 Lbs.	2500 Lbs. 11' Set 1500 Lbs. 8'6" Set	4500 Lbs.
raight Runs Charging	Use of Pier	Barring Down	Barring Down When Necessary	Barring Down and Fill Up	(a)	Use of Pier	Use of Pier
al Trouble mall Set	Filled Up If Any	Barred	Recharged, Regardless of No. Runs	Fill With Coal	Ordinary Fill With Fuel; Large Bar Down	Fresh Coal	Have None
ood if Proper and Doughnut ate On Grates	Practically All Coked No Dark Area	Cold On Top	Bright at Periphery Ragged Black Center Low Edge, High Center	Surface of Fuel Bed Irregular	Dark Red	Dull Red	Active In All Portions
Filled Good ice On e Sets	No.	Yes; Gives Even Fuel-Bed Differential	No, Unless Conditions Abnormal	No.	No.	No; Edge Kept Slightly Higher Than Center	No.
"—30"	30"	22"	26"	30"	32"—35"	24"—28"	28"
50—1350 (a)	(a) 1250—1400 (b) Not Determined	(a) 1700 (b) 1400	(a) 1000 (b) 750	(a) 1740 (b) X	(a) 900—1100 (b) None	(a) 950 (b) 525	(a) 1000 (b) 600
Eliminates and Easier Light	No; Temperature Control On Carburetter	Right After Stack; To Prevent Pops	Yes; Reduces Smoke	No; Lags 2 Sec. To Minimize Explosion	Yes.	No; 6 Sec. Later CO_2 Too High To Use Air So Early	Yes; Smoke Elimination
Light Charge, Fuel Min. Tertiary Air	Use of Tertiary Air	Effort Made to Burn In Set	Sufficient Air, Pilot Lights, Prompt Attention to Blow Holes	Lighting Carburetter Immediately Pilot Light On Stack	Tertiary Air	Correct Adjustment of Carburetter Air	Same As Ques. 15 and Tertiary Air
ry Small	15%	Very Small	8%	14% Average	None	None	None
Known	Not Used	Have None	5 Lbs.	Have None	(a)	0.2%	Negligible
ncertain	40 Lbs.	31 Lbs.	40—45 Lbs.	36 Lbs.	40—45 Lbs.	29 Lbs.	30 Lbs.
No (a)	Yes; Believe Has Tendency To Stop Arching	No.	Yes; Less Intimate Contact, Blow Holes and Cooler Gen.	(a)	No	Yes	No
7 Min. Cycle 3—45.6% n 0—3.0% Run 9.6—26.2% un 24.0—39.0% Run 2.4—20.0% 0—2.6%	4 Min. Cycle Blow 33 1/3% First Up Run 33 1/3% Back Run 29 1/6% Last Up Run 4 1/6% Purge 3—5 Sec.	6.2 Min. Cycle Blow 43.5% Run 56.5% Down Steam 50—60% Air Purge 10.5 Sec. Blow Run Not Stated	4 Min. Cycle Blow 37%—88.8 Sec. Blow Run 5%—12.0 Sec. First Up Run 28% —67.2 Sec. Back Run 26%—62.4 Sec. Last Up Run 2% —4.8 Sec. Purge 2%—4.8 Sec.	4 Min. Cycle Blow 37%—89 Sec. Blow Run 5%—12 Sec. Up Run 28%—67 Sec. Down Run 26%—62.4 Sec. Up Steam Purge 2% —4.8 Sec. Air Purge 2%—4.8 Sec.	6 Min. Cycle Blow 27—28% Back Run 32—33%	4 Min. 45 Sec. Cycle Blow 100 Sec. Blow Run 10 Sec. First Up Steam 69 Sec. Down Steam 90 Sec. Last Up Steam 10 Sec. Purge 6 Sec.	5 Min. Cycle Blow 75 Sec. Blow Run 20 Sec. Purge 6 Sec. Up Steam 99 Sec. Back Run 100 Sec. 2 Min. Blow Run Into Holder After Coaling

	QUESTIONS — COMPANY ➡	I.	II.	III.	IV.	V.
22	Spacing Used for Carburetter Checker Brick; How They Placed (a) How Many Courses? (b) Size of Brick	7" Spacing Straight (a) 14 (b) Straight Brick	All Staggered (a) 18 (6-2½" 1st) (6-3" 2nd) (6-3½" 3rd) (b) Standard	2½" Staggered (a) 20 Courses (b) Standard	2½" Staggered (a) Varies With Size of Shell (b) Standard	2½—3" Staggered (a) 12—20 (b) Standard
23	Superheater Checkering	37 Courses 2½" Spacing Straight Brick	42 Courses Staggered 11—3½" 1st. 11—3" 2nd. 11—2½" 3rd. 9—2" 4th.	2½" Staggered (a) 37 Courses (b) Standard	2½" Staggered (a) Varies With Size of Shell (b) Standard	1"—3" Staggered (a) 22—45 (b) Standard
24	Temperature Normal at Base of Superheater? Exactly Where Taken?	1500 F Central Point of Crossover	1380—1410 F 6' From Bottom	1375 F 5½' From Bottom	1370 F 6 Courses Above Arch	1415—1500 F Base
25	Coke Used for Bringing Machines Up to Heat?	No.	Yes, After Cleans	Yes	Yes	Yes
26	Have Explosions Occurred During the Starting Up Period?	No.	No	No	No	No
27	How Often Are Fires Cleaned?	9 Hrs.	14 Hrs.	8 Hrs.	12 Hrs.	12 Hrs. On 8, 9 & 10' Sets 24 Hrs. On 4 and 6' Sets
28	Man Hours Required for Clinkering Per Million Cubic Feet of Gas Produced	4½	6	2.8	1.0	2.4—3.7
29	Percent of Fuel Fired Reclaimed From Generator Cleaning	Not Known	App. 1%	None	10%	Not Known
30	Percent of Combustible In Ash	Not Known	Not Known	(a)	70%	Not Known
31	Credit Given to Fuel Charged For Material Reclaimed?	Full Credit	No Credit	(a)	None	Reused Without Weighing Small Used at Boiler
32	Disposition of Reclaimed Combustible Material?	Boiler Fuel	Used Again	(a)	Boiler	Boiler House
33	Tar Produced and How Compares with Coke Operation. Answer In Percent of Total Oil Carburetted	Not Known	Not Known	Approx. 10% Oil	16% X	15%—22% More With Coal Than Coke Coke 10—12%
34	Average Analysis of Blast Gases	Not Known	Have Not Taken	(a)	CO_2 13% at Generator Offtake	CO_2 19—19.5%
35	What Is the B.T.U. of the Blue Gas? Up Run. Back Run.	Up 315 Back 290	Up 300 (Calc.) Back (a)	(a)	Up 324 Down 308	Not Known
36	Analysis of Blue Gas On the Up Run On the Back Run or Down Run	Not Known	Up CO_2 4.9% Ill. 0.6% O_2 0.3% CO 32.3% CH_4 3.71% H_2 44.97% N_2 13.22% Back (a)	(a)	Up CO_2 6.7% Ill. 0.5% O_2 1.0% CO 33.3% H_2 50.1% CH_4 0.2% N_2 8.2% Down CO_2 5.9% Ill. 0.3% O_2 1.0% CO 32.0% H_2 49.3% CH_4 0.2% N_2 11.3%	Not Known
37	Cyanogen In Gas at the Outlet of Condensing System?	Not Known	Not Known	(a)	(a)	Not Known
38	Average Operating Results Over One Month B.T.U. of Finished Gas, Fuel Per M, Oil Per M, Steam Per M, and Oil Efficiency	B.T.U. 532 Fuel 30 Lbs. Oil 2.7 Steam X Eff. 103,000	B.T.U. 461 Fuel 28.14 Lbs. Oil 2.4 Steam 45 Lbs. Eff. 86,600	(a)	B.T.U. 535 Fuel 26.75 Lbs. Oil 3.21 Steam 40 Lbs. Eff. X	B.T.U. 555 Fuel 29.03 Lbs. Oil 2.94 Steam 32.0 Lbs. Eff. 106,000
39	Type of Set. Size of the Set	Back Run 10' Set	10' Reverse Steam Circ. Plate Under Grates 5'-6" Hole	(a) 7'6" Straight Run U.G.I.	12' Williamson Straight Run	6' U. G. I.

(a) No answer received. Company V reports eight plants, of which only two used 100 per cent coal.

(c) Plant XII uses 100 per cent Illinois coal; all others use Eastern bituminous coal.

	VI.	VII.	VIII.	IX.	X.	XI.	XII.
Staggered —20 ndard	3" Straight Flue (a) 16 (b) Standard	6" Straight Flue (a) 16 (b) Standard	3½" Straight Flue (a) 10 (b) Standard	Bottom 4 Courses 2½" Spacing Next 4 Courses 3" Spacing Next 5 Courses 4" Spacing Placed Straight Flue (a) 13 (b) Standard	3" Straight Flue (a) X (b) No. 1	Straight (a) 13 Courses (b) No. 1	4½" Base to Base (a) 12 (b) Special 14"
taggered —45 ndard	3" Straight Flue (a) 34 (b) Standard	4" Straight Flue (a) 40 (b) Standard	2½" Straight Flue (a) 33—36 (b) Standard	X	2½" Staggered (a) X (b) No. 1	Straight (a) 33 Courses (b) No. 1	2½" Base to Base Staggered (a) 38 (b) Special 14"
500 F se	1400 F 32 From Top Arch	1500 (App.) F 1450 About Half Way	1475 F Just Below Lintel Tiles	1450 F Bottom	1380 F 3 Courses From Bottom	Variable 2½" Above Arch	1500 F 4 Courses Above Arch
es	Only When Originally Start Set	Yes	Coke or Reclaimed Fuel Used	Yes	No	No	No
o	Slight Pops With Wet Fuel	No	Slight Pops	No	No	No	No
8, 9 & 10' and 6' Sets	12—14 Hrs.	12 Hrs.	8 Hrs.	Once Each Day	14 Hrs.	16 Hrs.	7½ Hrs.
-3.7	2.5—3.0	18	8	5	(a)	2 1/3	5—6
Known	4%	6%	2%	10%	None	0.5%	Negligible
Known	50%	Not Known	19%	40%	(a)	2%	20%
out Weighing d at Boiler	20% of Wt. of Reclaimed Fuel Credited	Reused Without Being Charged Out	½ Credit	$2.50 Per Ton	No Reclaimed Fuel	None	If Aany Price of Boiler Fuel
House	Boiler House	Do	Start Up Set, Boiler Fuel	Boiler Fuel	(a)	Generator Fuel	Boiler
More With an Coke —12%	No Figures	Not Known	12% 15—20% More With Coal	10% (a)	0.6 Gal. Per M. No Difference	15%	10% Approx. Same
—19.5%	CO_2 12.4% CO 8.4% At Generator Offtake	CO_2 12% O_2 0.3% CO 12%	CO_2 16% Ill. 0.1% O_2 2.5% H_2 2.4% N_2 73%	(a)	CO_2 16% O_2 4%	At Gen. Top CO_2 11.8% Ill. 0.2% O_2 0.6% CO 11.1% N_2 76.3% At Sup. Top CO_2 16%	Gen. Offtake CO_2 9.5% O_2 1.1% CO 16.1% H_2 5.2% CH_4 1.1% N_2 67% B.T.U. 80 Blow Run CO_2 4.4% Ill. 0.8% O_2 0.7% CO 25.8% H_2 13.9% CH_4 2.0% N_2 52.4% B.T.U. 164 Stack CO_2 16.5% O_2 4.1% CO 1.1% H_2 2.3% N_2 76% B.T.U. 10.4
Known	Up 325 Back 315	300	Up 316 (Calc.) Back 310	(a)	(a)	Up Run 340 Down Run 320	Up Run 336 Back Run 331
Known	Up CO_2 8.4% Ill. 0.6% O_2 0.8% CO 30.6% CH_4 6.2% H_2 45% N_2 8% Back CO_2 8.8% Ill. 0.4% O_2 0.6% CO 28.2% CH_4 5.6% H_2 48.0% N_2 8.4%	Composite CO_2 5.4% Ill. 0.3% O_2 0.7% CO 39.1% CH_4 2.5% H_2 48.7% N_2 3.3%	Up CO_2 7.4% Ill. 1.3% O_2 0.4% H_2 49.9% CO 28.3% CH_4 0.57% C_2 H_2 1.47% N_2 10.66% Back CO_2 9.6% Ill. 1.4% O_2 1.6% H_2 53.3% CO 17.7% CH_4 3.01% C_2 H_2 0.93% N_2 12.46%	(a)	(a)	(a)	Up CO_2 9.1% Ill. 1.% O_2 0.6% CO 26.1% H_2 52.9% CH_4 4.6% N_2 4.9 Back CO_2 7.2% Ill. 0.7% O_2 0.4% CO 26.2% H_2 57.8% CH_4 4.4% N_2 3.3%
Known	Not Known	Not Known	2 Gr. Per 100 Cu. Ft.	(a)	(a)	No Evidence of CN Present	796 Gr. Inlet Purifier 2.33 Gr. Outlet Purifier
555 9.03 Lbs. .94 32.0 Lbs. 06,000	(a)	B.T.U. 534 Fuel 29.84 Lbs. Oil 2.8 Steam 32.3 Lbs. Eff. 103,100	B.T.U. 525 Fuel 26.46 Lbs. Oil 2.62 Steam 43.66 Lbs. Eff. 105,000	B.T.U. 535 Fuel 30 Lbs. Oil 3.02 Steam X Eff. 98,000	(a)	B.T.U. 560 Fuel 28.0 Lbs. Oil 3.3 Steam 29.0 Lbs. Eff. 96,000	B.T.U. 480 Fuel 32.69 Lbs. Oil 2.2 Steam 30 Lbs. Eff. 101,200
G. I.	9' Generator With Pier and Chrisman Cycle	10' Gas Machinery Automatic Straight Run	11' Back Run	10' Straight Run	11' Pier Back Run	11' Machine (1) 8'-6" Machine (2) Pier Chrisman Down Run	11' Back Run Pier

(d) In B.T.U. Per Gallon, Calculated According to the formula. (19.5 X Ga. Oil Per M) + (B.T.U. of Finished Gas—300) = B.T.U. 1 Gal. Gal. Oil In.

(e) 1 Year's Operation.

The lime for concentrate is twice that for sulphate because twice as much liquor goes through the still.

Of course there is one fundamental figure which I assumed different from what Mr. Beebee used—that is I credited only 5 pounds of ammonia for concentrated liquor as against 5.55 recovered as sulphate. It would be interesting if Mr. Unger could give actual operating results to show that these figures should be closer together.

With regard to my including charge for upkeep and interest on the gas scrubbing equipment, it is of course impossible to figure any problem of this kind without including fixed charges (as was also done by Mr. Beebee) although I appreciate that fixed charges are often disregarded. The reason for this is, as stated by Mr. Unger, that we know we have to take the ammonia out of the gas and have to have apparatus to do it with; but the fixed charges are often what determines the type of plant for any purpose.

I hold no brief for one system of recovery as against the other. Certainly Mr. Beebee is right in saying that drawing general conclusions from such data is always a dangerous thing to do and my purpose in writing was, as stated, to suggest that when a plant must install additional ammonia recovery equipment, the relative merits of sulphate and liquor plants should be carefully weighed.

As a matter of fact I recently made some comparative figures for a plant to make 10,000 cu. ft. of gas per day and showed that for that particular installation a sulphate plant was not attractive. I strongly recommend however that the arrangements of apparatus should be on the basis of a sulphate plant layout so that if it were desired to install sulphate equipment later on it would mean only the extension of the building, the abandonment of the scrubbers, etc., and the addition of the sulphate equipment.

As stated in my letter I look for a price for gas works ammonia much less than 4.9c per lb. when the synthetic plants are operating smoothly at full capacity. The reason for this is that a large part of the gas works ammonia goes into products which could be made from synthetic ammonia, which is free from impurities, with much less expense for working up than from gas works ammonia. No matter how much the gas works liquor is "improved," as suggested by Mr. Unger, it can never be made fit for conversion into such commercial products, without purification; as can be done with the synthetic ammonia.

Demand for Liquors with Impurities

On the other hand, in the present transition state, there happens to be quite a demand for liquor containing large percentages of impurities so that in one instance that has come to my attention a plant is paying the freight on its impure liquor shipped 250 miles and getting a better net return than it can get by improving it and shipping to a firm only 40 miles away which makes a specialty of purchasing "improved" liquor—but I don't look for such a condition to last long.

The question of prices for ammonia in this country, is very complicated, being tied up with the price of Chilean nitrate, the possibility of large imports of very low price synthetic ammonia products from abroad which (so called dumping) is said to have been prevented only by pressure brought by strong financial interests here and a number of other factors all of which lead me to look for a drop in the return from gas works ammonia liquor. On the other hand, I do not look for any appreciable drop in the return from sulphate.

W. I. Battin.

Beebee's Additional Comments

Editor, American Gas Journal:

I have your letter of the 17th enclosing a letter from Mr. W. I. Battin and also a letter from Dr. John S. Unger relative to my article "What Price Ammonia."

There has always been a feeling on my part which I think has best been expressed by Dr. D. W. Wilson recently in which he states that the average accounting system of a gas plant is designed to make the maximum number of people happy. I have always been impressed that in the usual system of gas works accounting most of the costs in the various phases are spread in such a manner that an accurate record in the cost of any one particular phase is difficult to get. We have felt this was sufficiently the case so that for quite some time we have been carrying on a system of accounts relative to the various phases of our operations in which we feel the true costs of these various phases is more nearly indicated than in the usual system. I will readily admit that the costs given in my article are higher than usually given but they are the actual result of the situation just outlined.

I think Dr. Unger and Mr. Battin are absolutely correct in the points they have raised and I do not care to take exception to any of their statements.

The purpose of my article was intended to throw some light on the costs of sulphate manufacture in a small plant when all costs are included. The reason of this aim was because we have been impressed that it is human nature to think that the sidewalk on the other side of the street is better shoveled off until we get over on the other side. The purpose of my article was because there are undoubtedly many, as were we, who have become discouraged at the declining credit for ammonia liquor and who may feel that sulphate is a solution to the situation; and is offered as a caution that they may "look before they leap."

Dr. Unger raises the point that the ammonia must be eliminated from the gas and that the equipment required for scrubbing the gas with water and treating it for sulphuric acid would be part of the gas manufacturing apparatus and to charge it to the ammonia recovery is neither fair nor reasonable. From this I feel that Dr. Unger has missed the purpose of my article, since its purpose was intended to be a guide by which an operator might determine whether such ammonia as is present in the gas can be more cheaply removed by the liquor process rather than the sulphate process. Obviously, in order for an operator to determine which method provides the cheapest means for eliminating the ammonia impurity from the gas, it is very necessary that the fixed charges be included. In my article I have endeavored to bring out that in a sulphate plant, particularly where a small tonnage of sulphate is made, that the fixed charges assume alarming proportions and must certainly be given consideration before it is possible to determine by which method the ammonia can be more cheaply disposed of.

A. M. Beebee.

What Price, Service Department

By Special Correspondent

WHAT and why is a Service Department? What does it cost?

Is it a consistent supporter of the public relations policy of the Utility Company?

A service call might be defined as a notice from the customer that some conditions of gas supply or utilization are not giving satisfaction. The so-called Service Department, Trouble Department, Complaint Department, Utilization Department, etc., is organized to respond to these calls, to correct these conditions, and to instruct the customer in the better utilization of gas.

All of this work costs money. Some of the work which might be classified as work on the Gas Company's property, and involving the securing of an adequate supply of gas at the outlet of the customers meter is quite generally accepted as being a definite Company obligation and a necessary operating expense. Other work, such as cleaning and repairing appliances, adjusting burners, repairing leaks in appliances and house piping, cleaning, repairing or enlarging house piping, is of such a nature that considerable discretion is needed to maintain a proper degree of satisfaction to the customer and still be consistent with a permissible operating expense.

In this interesting contribution, outlining a representative company's service policy, reference is made to the condition whereby "a great many customers are not acquainted with the fact that they may call the Gas Company and have their appliance fixed up."

This state of affairs, generally speaking, is a strong argument for a smooth running Service Department, backed up by a well organized system of Service education.

Any gas customer can stand liberal cultivation in this latter regard.—Editor.

Almost every operator of a Gas Service Department is continually faced with the problem of how far to go with gratuitous service to the customer. Appliances and house piping are the property of the customer and much of this equipment is old, needs repair and cleaning, and will not give good service unless this work is done. Should the service man do this work for the customer, especially on appliances the Company does not sell, should the work be done free to the customer, and how much time should the service man spend on a customer's equipment in order to put it into proper condition? Some experience in the operation of a policy on this problem may be of interest. In one Gas Company where emphasis had been placed on satisfying the customer on all service calls, a policy was worked out which classified service calls and established a schedule of prices for labor and material which brought to light some interesting information. The following table of prices and classification of service is quite self-explanatory.

TABLE 1
SCHEDULE OF PRICES FOR GAS APPLIANCE REPAIRS

All service will be charged for which results in a repair made to customer's appliances or piping. These charges will include cost of material used plus a labor charge based on the following schedule.

Labor Charge

1—Repair labor, 20 minutes time or less.....$ .50
2—Repair labor over 20 minutes and up to 40 minutes.... 1.00
3—Repair labor over 40 minutes and up to 60 minutes.... 1.50
4—The same rate of $1.50 per hour to apply for each additional 20 minutes thereafter.
5—Drilling oven burners..... 1.50

Material Charge

These material prices do not include the installation cost. When installing material add the necessary labor charge as per the above schedule.

Rutz Lighter	$1.50	Stringer Valve	.75
Rutz Lighter, Cap	.20	Stringer Valve, Handle	.15
Rutz Lighter, Value		**Oven Valve**	1.00
Rutz Lighter, Tip	.15	Safety Stringer Valve	1.00
		Gas Plate Grate Bars	.15
		Orifice Nipple	.10
		Orifice Spud	.10
		No. 1 Mantle	.20
		No. 33 Mantle	.20
		No. 93 Mantle	.30
		No. 758 Mantle, 3 for	.25

Free Service

Will Consist of The Following:

1—Adjusting burners which do not require cleaning burners or cocks.
2—Temporary repairs to leaks or miscellaneous trouble.
3—Advice to customers on necessary repairs.
4—Insuring adequate pressure at outlet of meters.
5—Maintain for one year any appliance we sell.

In this table of prices, only a few of the common repair parts for stove repairs are listed. Water heater and other appliance parts are subject to the same policy and are sold at list prices. In addition to this, free service in the matter of cleaning, househeating and industrial appliances was established, as well as a systematic routine of inspection of all automatic water heaters and commercial and industrial installations. Records kept of various kinds of service activities showed, for ten months of operation, the effect of such an operating policy in quantity, satisfaction of work, and cost.

TABLE II
ANALYSIS OF SERVICE CALLS AND COLLECTIONS

Appliance calls	12,123
Poor pressure calls	4,525
Leak calls	3,983
Misc. calls and inspections	3,428
Total service calls	24,059
Number of above calls on which labor charges were made	4,166
Percentage of charge calls to total calls	17%
Average labor charge	$ .67
Total cost of charge calls	6967.00
Labor credit from charge calls	4563.00
Total field cost of service calls	35184.00
Total credit from charge calls	8197.00
Net field cost of service calls	25987.00

It was found that such a policy created practically no criticism from the customer and it gave the service man an opportunity to do conscientious work on appliances, cleaning and adjusting. It was noticed, however, that the service man needed to be somewhat of a salesman in order to sell the idea to the customer that certain repairs and cleaning were necessary. Of course, the majority of charge calls were for the minimum charge of 50 cents and the average labor charge on all calls was

only 67 cents. Most of the 50 cent charges were for cleaning burners, greasing or replacing cocks, or minor leak repairs which as a rule take only a few minutes time. A great deal of satisfaction was found in the ability of the service man to properly clean the oven burner without his feeling that he might be doing too much gratuitous work on the customer's equipment. There were very few misunderstandings between the customer and the Company as a result of this policy.

The service man, upon arrival at the customer's house, ascertains the trouble and looks over the appliances in general. If the trouble can be fixed free, he goes ahead and fixes it. If, however, the trouble cannot be fixed without making a charge, or if other work on appliances needs to be done, he so advises the customer, explaining why it should be done, what it would cost and tries to get the customer to agree to have this work done. If the customer will not agree to pay for the job, of course the work is not done, but such cases are quite rare. Occasions come up where the service man negotiates for repair work with the housemaid or someone not authorized to approve the expense, and such situations call for the exercise of judgment on the part of the service man. If the maid, for instance, won't authorize the work but thinks that the lady of the house would want it done, the service man does the work and makes a note to this effect on his copy of the sales order, and the lady later receives a telephone call from the office explaining the situation. If she then refuses to authorize the expense, of course the charge is cancelled.

Cash Collection Experience

An attempt is made to collect cash on the job but it was found that about only 20% of the charge jobs were paid to the service man. In very few cases of the credit jobs are there any collection difficulties.

On the free service schedule in Table I, it will be noted that temporary repairs to leaks or trouble calls are free. If the customer will not authorize payment of permanent repairs, the leak is stopped temporarily and the customer advised of the necessity of having permanent repairs made within a few days.

It has also been noticed that a great many customers are not acquainted with the fact that they may call the Gas Company and have their appliances fixed up. Many of them do not know who their appliance dealer is and they put up with poor appliance service either in silence or otherwise, when a call to the Gas Company Service Department would take care of their trouble immediately.

Several years experience in customers service work leads one to realize that while many gas customers take good care of their appliances and equipment, there is a still greater number who would rather have someone else do this work for them, and who do not object to paying for this kind of service. In most cases customers are accustomed to paying for service repairs on their washing machines, vacuum cleaners, phonographs, radios, automobiles, etc., and if approached in the proper manner have no objection to paying for similar service on gas stoves, water heaters and other gas appliances.

In many locations the Gas Company service man is the only competent man to properly repair or clean gas appliances, and the Gas Company should be prepared to meet this growing demand for appliance service. A charge for appliance repairs or cleaning service affords an excellent opportunity for the Gas Company to advertise its customers service work and give real efficient attention in repairs to the customers equipment and still keep the cost of service work within reason.

UNIFORMED METER READERS PROVE ASSET TO COMPANIES

Many gas companies who have garbed their meter readers in uniforms are very enthusiastic over the proposition and find the uniformed meter readers are a big asset.

One of the biggest assets in having uniformed meter readers is that of advertising the company. People always sit up and take notice when they see uniforms of any kind whatsoever and when they see gas company employees neatly uniformed they instinctively feel that the company is a snappy, top-notch institution. All of which is not only good advertising for the company, but all of which is also a helpful booster proposition for the company.

Again, uniformed employees are the biggest sort of an aid in doing away with fraud. This fact has been discovered by the Northern Indiana Public Service Company and has been broadcasted to the general public by the following news item which appeared in the Fort Wayne News-Sentinel, this being one of the principal cities served by the company:

"Gas Men Known by Distinctive Company Dress.

"By their dress, ye shall know them.

"Fort Wayne residents can easily recognize the meter readers and the collectors of the Northern Indiana Public Service Company, the gas company, for these employees are distinctively dressed in blue uniforms and they wear a cap bearing the letters 'N. I. P. S. Co.' During the summer months a dark blue shirt takes the place of a coat, as a part of the outfit.

"This information is being broadcasted by S. E. Mulholland, vice-president of the Northern Indiana Public Service Company, as the result of the recent activities here of fraudulent persons who claim to be agents of some one of the public utilities.

"Not only are our meter readers and our collectors uniformed but our other employees, such as fitters, who have occasion to go into homes, carry a double identification; first, a badge and secondly a card, which they will gladly show on request. I sincerely urge that Fort Wayne people remember for their own protection that no man is an employee of the Northern Indiana Public Service company who cannot easily and quickly identify himself."

That sort of thing is a great help to the gas company in increasing the confidence felt by the general public in the concern.

Experience of numerous gas companies shows that where the meter readers and collectors are uniformed it is quite generally the case that these employees feel more kindly toward the company and take a greater interest in the company than when they wear simply civilian clothes when going around on their duties. There is, of course, a real psychological reason why this should be the case—this reason being that any man feels more like he is part of the "army" when he wears a uniform. And for this reason, if for no other, it is the best sort of business for the gas company to uniform its meter readers and collectors in some distinctive manner.

A Fuel Price Clause in Rates For Domestic and Commercial Gas Service

By A. G. Mott

Chief Engineer, California, Railroad Commission

THE use of a so-called "fuel clause" in contracts for large blocks of electric power, making rate dependent upon the price of fuel, is not new but it is thought that the results of the application of the same principles to rates for domestic and commercial gas service may be of general interest. Such an application has been very successful in California where it has become generally known as the automatic gas rate.

The automatic gas rate in California had its inception in 1918, in the fixing of a rate to be charged by a gas company for gas delivered at wholesale to a municipal system for redistribution, at which time it was more or less of an experimental nature. The application and results obtained through the operation of this type of rate proved to be so satisfactory that, in 1921, it was urged before the Commission by representatives of the consumers that this form of rate be applied to domestic and commercial service. The Commission adopted this suggestion and at the present time the rates of practically all utilities supplying manufactured gas include this automatic feature. This form of rate has also been adopted by utilities supplying surplus natural gas for industrial use in competition with fuel oil and very satisfactory results have been obtained.

Dependence on Oil

The relative availability of coal and oil in the state has made California dependent upon the latter fuel for practically all industrial purposes, except where natural gas is available. With the exception of one plant using coal in a somewhat experimental way, all manufactured gas plants operate with oil as a fuel. The apparatus used may be simply described as a large vertical steel cylinder filled with fire brick, which are arranged in checkers to permit the passage of gases through them. The operation consists of alternate "heat-runs" during which the fire brick are heated by an oil fire and "make-runs" during which steam and oil pass through the hot brick. Under the influence of temperature, the oil breaks down and partially reacts with the steam, the process and product being roughly comparable with the manufacture of carburetted water gas.

The efficiency of the process varies between 3,000 and 5,000 cu. ft. of gas sold per barrel of oil.

At the customary market prices of oil ranging from $1.00 to $2.00 per barrel, according to market conditions of supply and demand, local freight rates, etc., the cost of fuel represents nearly half of the total cost of gas in the holder and about a quarter of the cost at the consumer's meter. The price of oil was therefore an important element in proceedings involving the determination of reasonable rates for manufactured gas and changes in the price were signals for application for increased rates on the part of gas companies or complaints alleging excessive rates on the part of those interested in keeping down prices to the consumers.

Under the so-called automatic gas rate, the Commission establishes a basic rate for gas which is predicated upon a basic price of oil and at the same time determines a differential to be added to or subtracted from the basic gas rate for each 10c per barrel increase or decrease in the price of oil. Gas companies are required to file with the Commission an affidavit covering each change in the price paid for oil. On the receipt of such an affidavit, new rates are calculated, published by a supplemental order, and become effective 30 days after the change in oil price. These changes being made in accordance with the provisions of the original order, no notices, public hearings or other formalities are required and the company or the public receives an exact recognition of the change in cost with the least practicable delay. As rates are quoted to the nearest cent, it has been found desirable to figure each change from the basic rate rather than from the effective rate in order to minimize the accumulation of added or dropped fractions. A copy of a typical order establishing this form of rate is attached to this paper as an appendix.

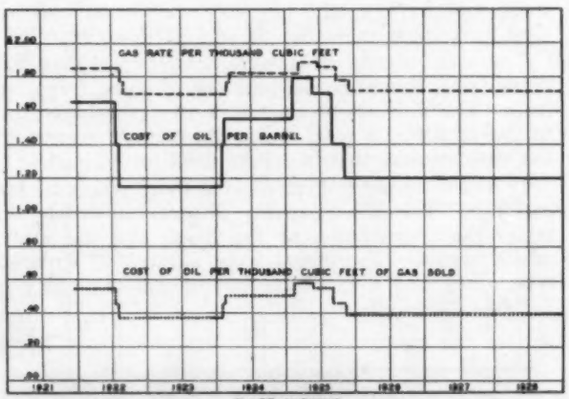


CHART SHOWING
OPERATION OF AUTOMATIC GAS RATE

At the present time, there are some 13 utilities supplying manufactured gas in California under the automatic rate. These companies sell approximately 20,000,000,000 cubic feet of gas per year and a change in gas rates of 1c per thousand feet would, therefore, approximate $200,000.00 a year. Since 1921, when the use of this type of rate was first extended to domestic and commercial service, there have been 12 basic changes in the market price of oil in addition to various local adjustments. Most of these changes in market price have amounted to 25c per barrel and, at an average differential of 2½c per thousand cubic feet for each 10c change in the price of oil, the corresponding change in consumers' gas bills exceeds a million dollars per year. Under the automatic gas rate, these changes have become effective without public hearing or other legal formalities. To have accomplished the same result under the usual rules of procedure would have required 180 rate proceedings, each involving the filing of an application or complaint, advertising of hearing, public hearing, and formal introduction of exhibits and testimony.

The public has benefited because the utilities would be constantly alive to the situation and rate increases would certainly be no less promptly applied nor more consistently urged than the decreases. At the same time

Read at the 1928 Conference of Public Utility Commission Engineers.

the utilities are well pleased because every rate application represents a golden opportunity for some publicity-seeking attorney to make political capital at the expense of the utility and its public relations. Perhaps the best test of the desirability of such a scheme is the satisfaction of the general public, as made evident by the general absence of complaint and agitation and the reduction in number of rate proceedings coming before the Commission.

A decision made following extensive formal proceedings, frequently results in considerable dissatisfaction on the part of one or more groups. On the other hand, the practical outcomes of the automatic rate changes have resulted in all groups receiving relatively fair treatement and with virtually no dissatisfaction.

A STURDY PAIR OF CARPENTER HORSES

Most plants or shops can use a pair of carpenter's horses and indeed few places are without these handy accessories. The trouble with most carpenter's horses, however, lies in the fact that they are usually made of wood and have a tendency to break or spread after they have been subjected to any hard usage.

The plant welder of a large Eastern shop, realizing these facts, constructed a pair out of some scrap angle iron. The finished product was an agreeable surprise to the carpenter's gang and a great improvement over the wooden ones that had been used in the past.

It was a simple task to oxweld these pieces of scrap together. The accompanying illustration clearly illustrates the construction of the horse and the location of the welds. The pieces were all welded with butt-type joints and a small amount of welding rod added for extra strength.

NEW STYLE TRUCK USED BY SOUTHERN COUNTIES GAS COMPANY

The accompanying photograph gives a good view of a new truck just built for the use of the Southern Counties Gas Company in Southern California. This truck has compartments at either side in which tools and other necessities are carried and there is an aisle down the center between the sides so that the tops of the compartments serve as seats for the workers. Piping is carried on shelves on either side of the car extending out from the floor of the truck.

It is claimed that this truck will transport more tools, pipe and other equipment and more workers comfortably than any form of truck yet used by this concern.

DOMESTIC OIL BURNER PRODUCTION

The Department of Commerce announces that, according to data collected at the biennial census of manufacturers taken in 1928, the production of domestic oil burners in 1927 was as follows: Mechanical or forced draft, 45,794, valued at $10,202,235; atmospheric (natural draft) 15,190, valued at $702,138; making a total of 60,984, valued at $10,904,373. No comparable data for previous census years are available.

The figures given above are preliminary and subject to such correction as may be found necessary upon further examination of the returns.

REMOVAL OF SULPHUR COMPOUNDS FROM GASES

The newer catalytic processes such as the synthesis of ammonia, synthesis of methanol from water gas, and synthesis of petroleum from water gas require the complete removal of sulphur compounds from the gases used, states the Department of Commerce. Even traces of organic sulphur compounds, which would be entirely unimportant when the gas is used as a fuel, are sufficient to destroy the catalysts used in these processes. Hydrogen sulphide may be satisfactorily removed on an industrial scale by well-known methods. The only satisfactory process for removal of organic sulphur to the required extent, which has been used on an industrial scale, in this country at least, involves liquefaction of the gas at low temperatures. It is desirable, however, to have a cheaper method. Consequently, the Pittsburgh Experiment Station of the United States Bureau of Mines is starting an investigation of this problem. It has been claimed by Franz Fischer of Germany that organic sulphur compounds may be completely converted to hydrogen sulphide at relatively low temperatures when the gas is passed over appropriate catalysts at relatively low temperatures and in the presence of hydrogen. Details of the process have been withheld, however. Evidently the process needs confirmation and presentation of results of detailed study.

TECHNICAL AND GENERAL MISCELLANY

WASTE HEAT RECOVERY

The oustanding features of the ideal recuperator are designated to be the following: First, the construction should be compact, second the material employed should be non-porous and must possess a high thermal conductivity, third the relationship of heating surface to the weight of the gaseous medium flowing through the tubes should be high, involving narrow flues, fourth the high velocity of gases in flues, which should be easily accessible for cleaning, fifth in order to obtain rapid heat transmission, the partition walls should be comparatively thin, but of sufficient mechanical strength to prevent leakage through joints and cracks caused by stress due to unavoidable expansion.

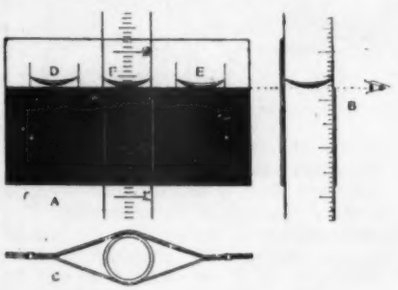
The three types of recuperators, the parallel-flow, the counter-flow and the cross-flow are considered. It is pointed out that heat transmission in regenerators depends to a large extent upon the time contact, on the area of exposed heat-emitting and heat-absorbing surface, on the specific heat of the material, and on the capacity of the heat conductivity of the checkerbrick, as well as on the correct proportion between the weight of the checkerbrick and that of the heat-emitting and heat-absorbing media. In a well designed regenerator the temperature difference of waste gases and preheated air during one reversal period should not exceed 80 to 100 degrees F.—*F. J. Bailey, W. Gregson and J. W. Reeber, Gas Journal, 1928, pages 130-1.*

USING ACTIVATED CARBON TO PURIFY GAS

Activated charcoal or carbon has been used for absorbing solvents which are distilled out of solutions and the like, and also for absorbing gases and vapors in mixtures of gaseous materials. Experimental installations of activated carbon gas purifying plants have been erected and tested out in Germany. The process has also been worked out on a practical scale at Recklinghausen. After the gas passes through the ammonia washer, it has eight to ten grams of sulphuretted hydrogen and it should contain 0.2 to 0.4 gram of ammonia per cubic meter and about 0.8 per cent of oxygen. It must further be practically free from napthalene. The actual absorption is best effected at a temperature of 35 degrees C. The gas is moistened by passage through a vessel filled with wooden grids and supplied with steam or water. Then it passes warm and moist to the carbon chambers. Two filters are used for the sulphur. They are connected in series. The rate of flow of the gas through the carbon bed is 60 to 70 millimeters per second. The pressure loss is 50 to 60 millimeters of water, according to the extent of the saturation of the carbon. At the outlet of the purifiers, the gas is practically free from sulphuretted hydrogen but the carbon disulphide remains. Further details are given in Gas Journal, 1928, pages 256ff.

BURETTE READING DEVICE

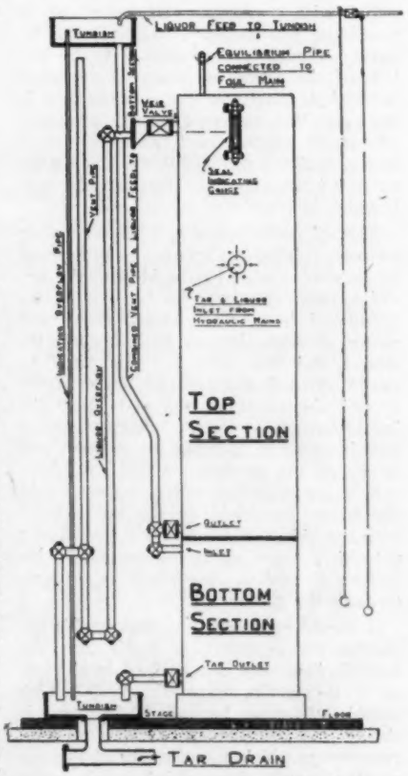
A piece of white celluloid, measuring about three inches by one and one half inch, has two thirds of its area blackened, as shown in diagram A. Over the blackened portion is placed a strip of transparent celluloid so that its upper edge coincides with the upper margin of the black area and affixed by means of eyelets near the ends—thus leaving an opening between the pieces sufficient to allow the device to be slipped over the burette (as shown in diagram C) and to remain in any desired position.



A burette reading is made as follows:—The device is placed on the burette so that the upper margin of the black area is just below the meniscus. (The meniscus now appears as a black crescent with a very sharp lower outline). The eye is brought into the position such that the upper edge of the transparent celluloid (in front of the burette) and the upper margin of the black area (behind the burette) are seen as one coincident line, and the device is then gradually raised until this line forms a tangent to the black crescent of the meniscus. This is shown in diagram B and also at F. The slightest movement of the eye throws the front and back margins of the device out of alignment, while the slightest movement of the device itself causes the meniscus to appear above or below the coincident margins, as shown at D and E in the diagram. After adjusting the device in this manner, the burette reading is obtained by noting the position on the burette of the upper edge of the transparent celluloid. The reading may be made at any time without further reference to the meniscus, provided that the position of the device in the burette is not altered. And since the celluloid is transparent and is in actual contact with the graduations, it is easy to read to the nearest 0.01 cubic centimeter with the aid of a pocket lens.—*M. Hyman, Journal of the Society of Chemical Industry, 1928 page 100T.*

USE OF TAR TOWERS

In a recent address before the North of England Gas Managers' Association, Dugald Currie, the President, described certain practice at an English gas works of which the use of tar towers is particularly interesting. The bench of inclined retorts is provided with four tar towers of the kind shown in the accompanying illustration. The tar and liquor from the hydraulic main enter the tower about nine and one half feet from the bottom of the top section, while near the top of the tower, and at approximately the same level as the bottom of the dip pipes, an overflow valve of the weir type is fixed with indicator for showing to what extent the valve is opened. A special cast iron outlet is fixed to this valve, to which is attached the liquor overflow pipe which drops to within three feet of the stage floor, where a syphon seal is formed with an air vent carried up 1.5 feet above the top of the tower. The



TAR TOWER.

hydraulic mains of two settings on each side of the bench are connected to two towers at one end of the bench, while at the opposite end the hydraulic mains from three settings on each side are connected to two tar towers respectively.

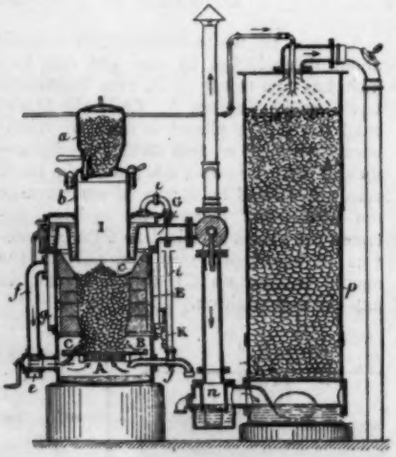
The method of operating the tar towers is as follows. When it is desired to run off tar, the plug on the bottom outlet of the top section is closed, thus completely isolating the bottom section of the tower from the top section. The tar outlet valve at the bottom of the bottom section is then opened until all tar is run from this section of the tower. When this has been accomplished, the run off valve is closed, and the liquor supply valve to the top tundish opened. Liquor then flows from the top tundish through the inlet connection near the top of the bottom section; and when the section is full, the liquor overflows from the top tundish to the bottom tundish by means of the pipe provided for this purpose, the overflowing of the liquor indicating that the bottom section of the tower is completely full. The liquor supply is then turned off, and the outlet valve at the bottom of the top section opened, thus putting both sections of the tower into communication with one another. It will be readily understood that during the running-off process the seal of the dip pipes is undisturbed, and that no exact regulation of the tar run-off or liquor feed is required.—*Gas Journal, 1928, 107-112.*

VERTICAL PRODUCER WITH PURIFICATION EQUIPMENT

The generator or producer is composed of a cast iron grate A in which a circular plate B is located, furnished with bars in the center and a groove along the circumference. The shaft of the generator is furnished with a refractory lining c as well as a casing E of sheet iron with double walls. Between the casing E and the lining c is located a space filled with sand, which has the effect of increasing the thermal insulation of the apparatus. At the top of the shaft is located a charging funnel a which is provided with a double closure so as to avoid the penetration of air into the apparatus during its operation. At the bottom of the funnel is located a vaporizer b which is heated by the sensible heat in the gases that emerge from the producer. The steam which comes from this vaporizer or boiler is directed down into the interior of the generator through the tube i, which is controlled by the valve j.

The apparatus operates in the following manner: Under the effect of the exhaust or vacuum created by the blower, the air, which penetrates into the interior of the cylindrical body E is heated there and passes through the ash box through the pipe f and the valve e. The air then passes through the bars of the grate or around the edges of the plate B. The humidification of the air which is necessary in order to increase the thermal efficiency of the producer, making a mixed gas, is accomplished either by means of the steam furnished by the boiler b or with the aid of water which is introduced through the ash pit by means of the injectors k and is vaporized in passing through the grate.

It should be pointed out that in this apparatus the vaporizer or boiler uses the sensible heat that is contained in the gas as it leaves the generator, heat which would otherwise be completely lost. It should also be pointed out that the arrangements which are provided in this apparatus permit the continuous operation of the generator and make the use of regulating devices of minimum importance. The water injectors may be regulated so that their feed is proportioned properly to the production of the apparatus. The apparatus is also designed so that abrupt changes through the generator may be taken care of in an efficient manner by manipulation of the valve j, which automatically controls the quantity of steam admitted into the ash pit.—*Journal des Usines a Gaz, 1928, pages 413-4.*



VALUE OF OXIDE AND ITS ABSORPTIVITY FOR SULPHURETTED HYDROGEN

It has been demonstrated that the content of iron oxide in the purifying mass is not a measure of its suitability for removing sulphuretted hydrogen from gas. Certain disadvantageous conditions mitigate against the activity of the oxide. First there is the water content, which varies according to the grade of the oxide. Then there is the concentration of the sulphuretted hydrogen in the gas. The purification effect of the oxide rises as the concentration of the sulphuretted hydrogen in the gas decreases. This is contrary to what is found in actual practice. The temperature is also important, and it does not have to rise too high. The degree of porosity of refractory brick, acidity or of alkalinity is also important. An alkalinity of plus or minus 2 per cent (calculated in terms of lime) is found to be most favorable, and the presence of dilute sulphuric acid appears to be without any influence. This is also a statement which finds contradiction.

The only real measure of the value of an oxide is the amount of sulphur that it will absorb, on the assumption that the entire purifying mass is allowed to react uniformly with the gas and that there are not fissures and paths of least resistance in the mass which the gas follows, with the result that only a certain part of the mass enters into the reaction. The last-named circumstance must also be the cause of the numerous discrepancies between the results of investigations.—*S. de Jong, Het Gas, volume 48, 1928, pages 195 ff.*

PROTECTION OF UNDERGROUND PIPE FROM CORROSION

A method of protecting pipe from corrosion when used underground which was adopted in Southern California is described.

The priming coat was made by the proper blending of bitumens and dissolved in a suitable volatile thinner. It is first applied by hand-brushing or ragging on with a canvas sling. In either case it is rubbed well into the pipe and is put on immediately after sand-blasting, whether in the field or in the yard. One gallon covers about three hundred square feet. The coat drys in two hours and forms a perfect bond with the pipe. It is followed by a heavy coat, which is made of the same materials as in the first instance but blended to a consistency of molasses. The coat is flowed on or spread with a hand brush or canvas sling. It is allowed to dry for one day and then a second coat is applied. One gallon of the coating covers about 160 square feet. The coat is tough and tight and is sufficient protection in good soils.

Sometimes it is necessary to have more protection and then the pipe is covered after this treatment with a spiral wrap of impregnating reinforcing cotton, which is of special loose weave. The cotton coating is then covered with one or two coats of the thick coating material. This process can be repeated a number of times until a coating of the desired thickness and protective quality is obtained.—*E. O. Slater, Industrial and Engineering Chemistry, 1929, 19-21.*

REFRACTORIES IN THE GAS INDUSTRY

The raw materials used in the manufacture of firebrick, siliceous brick and silica brick for use in the gas industry are classified. The following tabulation shows the composition, specific gravity and

HIGH PRESSURE STORAGE HOLDER

The Most economical form of High Pressure Storage and the *only type which* permits of future enlargement.

The most practical shape for permanent tightness and it can be fabricated and erected at the least cost.

Built on established Boiler principles.

The smallest unit will compare favorably in first cost with any other form of high pressure storage and yet the cost per cubic foot varies inversely with the size.

Attractive in appearance, saving in ground space, low in maintenance.

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CINCINNATI, OHIO

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ARTHUR A. POPE, Sec. and Treas. WILLIAM A. MILLER, Chief Eng. P. C. RODGERS, Asst. Sales Mgr.
NEW YORK OFFICE—75 West Street—P. F. McEnaney, Mgr. Tel. Bowling Green 8186
New England Representative—Eastern Service Co., Boston.

"Pittsburg" points the way again

FROM the very start of the Pittsburg Water Heater Company in the water heater field, its progress has been marked by a series of continuous successes of everything this Company has introduced. Always vigilant to maintain its leadership and enviable position in the water heater field this aggressive concern has always been able to foresee public demand for better, cheaper and yet more practical and efficient hot water service, and has supplied the demand by anticipating every trend in this important field.

Now again the Pittsburg Water Heater points the way by placing upon the market an *Instantaneous* Water Heater of outstanding merit to retail at the surprisingly low price of only $95.

MAIL THIS COUPON

with a new *Instantaneous* WATER HEATER to sell at... $95.00 RETAIL

GET all the facts about this new 3-gallon copper coil instantaneous heater.

THE PITTSBURG WATER HEATER CO.

Pittsburgh, Pa.

Clip and Mail this Coupon Now!

for full details and discounts

Send us all the facts about the new 3-gallon instantaneous heater.

Company Name .....

Per .....

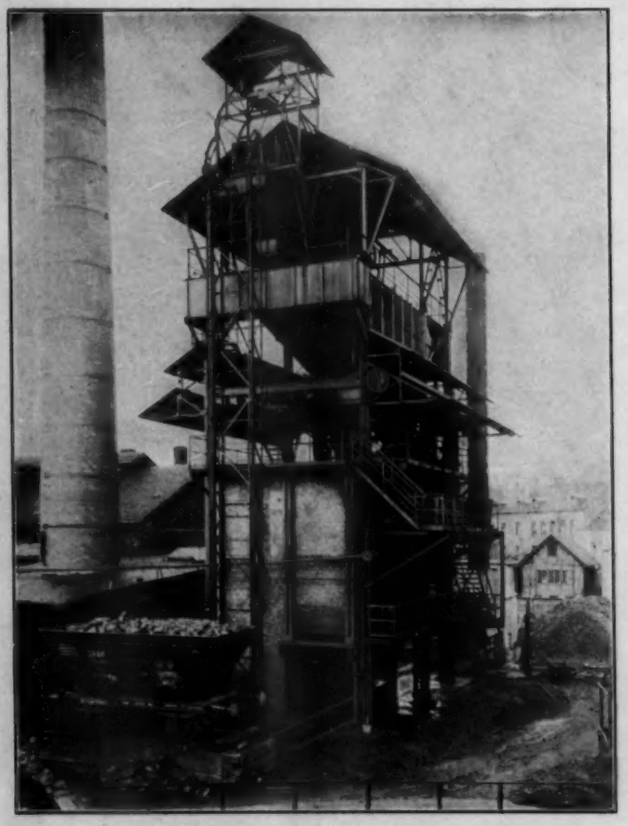
Address .....

.....

"INDUGAS"

VERTICAL CHAMBER OVENS

With Water-sealed Drop Door
INTERMITTENT TYPE



Minimum Labor
Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

City	Time	Yield cu. ft. per net ton	Heating value B.t.u. (gross)
Baden, Switzerland	4 years average	14075	560
Olten, Switzerland	2 " "	13317	570
Friedrichshafen, Germany	4 " "	16045	515

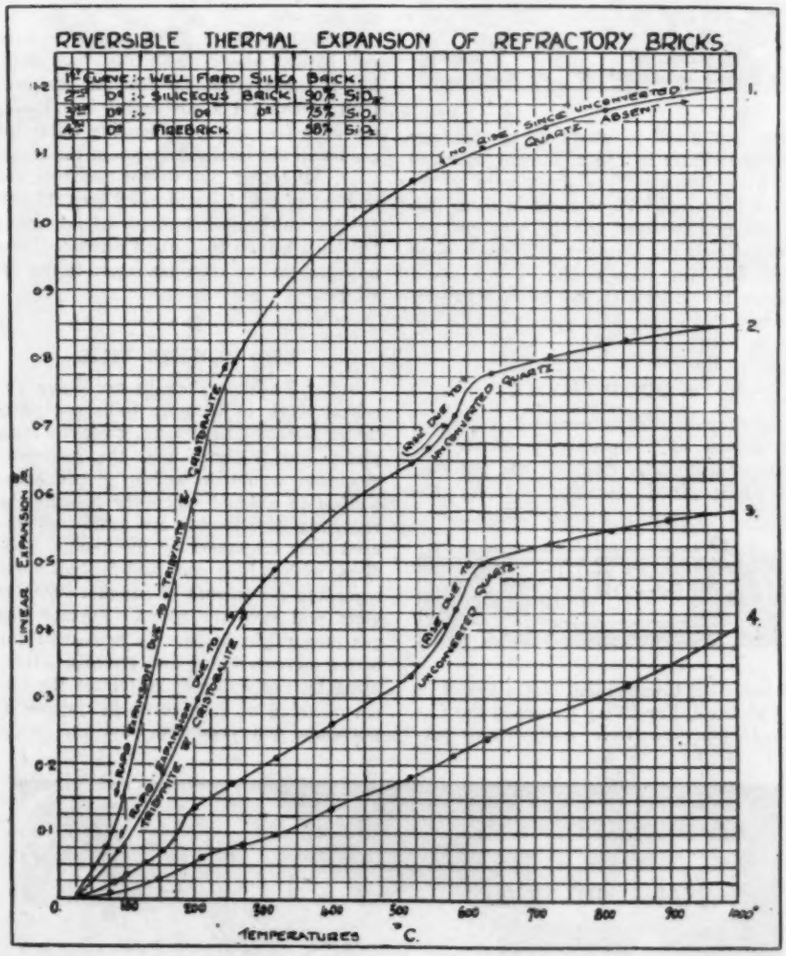
There's a Reason

Full information, layouts and estimates gladly furnished

INDUGAS COMPANY, INC.

114 LIBERTY STREET, NEW YORK

	Firebrick	Firebrick (siliceous)	Siliceous material	Silica brick
Silica	58.20	69.76	91.40	94.87
Titanium dioxide	1.00	1.00	0.41	0.26
Alumina	34.88	25.56	5.29	1.57
Iron oxide Fe_2O_3	3.19	1.79	1.25	0.72
Magnesia	0.51	0.38	0.20	0.19
Lime	0.57	0.60	0.55	2.21
Alkalies	0.71	0.85	1.01	0.31
Ignition loss	0.20	—	—	—
	100.16	99.94	100.11	100.31
Apparent sp. gr.	2.00	1.92	1.61	1.67
True sp. gr.	2.60	2.56	2.47	2.35
Porosity, in %.	23	25	35	29

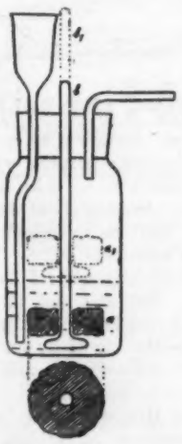

REVERSIBLE THERMAL EXPANSION OF REFRACTORY BRICKS
1st CURVE :- WELL FIRED SILICA BRICK.
2nd " :- SILICEOUS BRICK, 90% SiO2
3rd " :- " " 75% SiO2
4th " :- FIREBRICK 50% SiO2
NO SIGN SINCE UNCONVERTED QUARTZ ABSENT
LINEAR EXPANSION %
TEMPERATURES °C.

The chief requirements which must be fulfilled by the bricks are as follows: The volume must remain constant; that is, slight changes only should take place when the brick are heated to the working temperature. The bricks should be free from spalling tendency, which means that they should not be liable to disintegrate under the influence of the unavoidable temperature fluctuations. They must not collapse under working loads at the highest temperatures at which they are used. They must be chemically stable; they must possess mechanical strength, they must have adequate thermal conductivity and they should have good shape and texture.

The various brick are examined more closely under each one of the aforementioned requirements. The importance of using the right kind of jointing cement is also stressed. This cement must have a composition and texture dependent upon the nature of the brick cemented, the temperature to which it is going to be subjected and the nature of the corrosive agents with which it may come in contact. *—E. W. Smith and H. M. Spiers, Journal of the Society of Chemical Industry, 1928, pages 1278 to 1284.*

GAS GENERATOR FOR LABORATORY

In the discontinuous method of generating gases for laboratory use from such substances as iron sulphide, zinc, etc. in the production of sulphuretted hydrogen, etc., in apparatus which is not automatically controlled, it is a tedious matter to remove the acid or chemical after use. The accompanying illustration is that of a gas generator, which can be so adjusted at the end of the operation that neither acid nor material need be removed from the apparatus and which is thereafter easily set into operation



again. Through the three-holed stopper which closes the mouth of the bottle, are inserted first a funnel, then a glass rod, which is provided with a flat end, and finally the tube through which the gas escapes. The zinc or iron sulphide and the like that is used in the process is made in the form of a flat disc with a hole in the center, so that it can be passed around the glass rod. The disc rests upon the flattened end of the rod and when the apparatus is not needed to generate gas, the rod is lifted and the mass of zinc or sulphide of iron is removed from contact with the acid in the bottom of the bottle. The glass rod is lowered when it is desired to put the apparatus into operation again.—*E. J. Kraus, Chemiker Zeitung, 1928,* page 711.

Shush! Here's a Royal Secret! But Don't Tell Anyone in Old England

Gas fired refrigeration has been installed in the kitchens of Buckingham Palace, the London residence of the British king and queen, according to word received in the United States.

Publication of this news is not permitted in the British empire until the new equipment has been given a three-year trial. At the end of that period, if the installation meets with royal approval, the manufacturer of the refrigerator will be permitted to exploit the fact, and his product may have stamped on it the words "By Appointment to His Majesty, The King."

FIRST SELL THE BELL COWS

"You know," remarked a jeweler of our acquaintance, "this keeping up with the Jones has played h——l with me; that is, until I got to thinking about the thing and applied the fact that everybody's doing it to my own business.

"You see it's this way: I had a dandy little radio, that was not anything for looks; just a nice box and a little speaker that I set on the top of it, but it brought in receptions in good shape and all seemed to be perfectly satisfactory. One day, however, the Mrs. went over to the Jones for an afternoon of bridge, and that afternoon ruined my perfectly good radio. While at the bridge the Mrs. made the horrible discovery that the smart thing was such-and-such radio; a built in console, dressed-up—and, "if you had seen these why did you not say something about them, etc., bla, bla, bla." The result is I am now the owner of a dressed-up radio that don't give me a darn bit better music or more entertainment than my old set did, but the Mrs. is happy for we are radioing as the Jones do. I confess the deal got under my hide and caused me to do a little thinking and I concluded that the Jones were playing the deuce, not only with my pocketbook but with the pocket books of hundreds, yes thousands of other good Americans,—causing popsyboy to shell out for all sorts of things to keep in line.

"And then the thought came to me; why not get the Jones on this jeweler's staff? Why not get them to sell all comers? Today we are doing that little thing; 'yes,' we say to prospective purchasers, 'we sold a service, a ring or a wrist watch just like that to the Jones only yesterday. Oh, yes that is the mode today.'"

"Believe it or not, we can now see a very nice increase in the sale of our newer lines of merchandise through the application of the idea. To be sure we are truthful in saying that we sold such and such items to well known folks and whenever we get in a new line of merchandise we do some real selling to these leaders to get the thing started."

It seems to us that this is additional and sufficient proof to warrant gas appliance merchandisers to use additional effort to sell the Jones or "key" customers, as we have often referred to them in these columns, and let them sell the copy customers. Catch the climbers and the copiers will buy, for there's usually soft wood under the veneer, if you know what we mean.

A GOOD THEME

More and more advertising is making an appeal to prospective purchasers of the products advertised on the basis of "What it will do for You". "Keep that

School Girl Complexion, Not a Cough in a Car Load, For Every Cough in the Car Load" etc., etc. have made many purchasers, and now we find a number of the forward looking gas appliances manufacturers employing head lines and leads that tell the prospective customer what their appliances will do for the user. At this time we would like to suggest that probably if the gas man's own advertising took on themes of "what it will do for you" it would be worth while.

PARASITIC PARAPHERNALIA

"STOP THIEF!" "—that arrests 'em and arrests them quick when handcuffed to a true tale of the coal-eating coil in the furnace.

"Nothing is more timely than a furnace coil battle," says Ruudiments, "and nothing is more profitable for the gas man than to convert a coal-eating coil into a real care-free system of heating water for use by all the family throughout the whole year. Pointing out to the prospect the amount of coal it requires to keep the coil feeding him a partial supply of hot water has been known to convert many business men and thrifty home managers to the use of gas."

GET BEHIND THIS

Better Business Bureaus are doing excellent work in warning folks regarding 'phoney sales and fake merchandising plans, and it seems that the gas merchandiser would do well to give this organization a hand whenever possible, by reporting devices that are sometimes offered their customers by fly-by-night peddlers, with a long cock-and-the-bull story regarding the amount of gas that such devices will save the users. Further, the gas man might assist this movement for better merchandising and truthful advertising by explaining to customers the exact meaning of such terms as 'japanned', 'porcelain' and 'enameled,' and 'the gauge

of metals.' Along this line, a great many gas merchandisers now feel that premiums and comparative prices have no business in appliance merchandising.

LOADING FOWLING PIECE FOR BIG GAME

February usually finds the New Year's sales activities program all worked out and things beginning to shape up for early Spring business. We understand that a number of gas companies over the country are making ready for an aggressive effort to promote the sale of gas refrigerators starting early in February, while others are going after the cooking load in a big way. With the aid of the Home Service departments these companies expect to campaign the fact that "home cooked food is better."

Manufacturers are said to have some elaborate plans for helping the gas man this year. It is said range, incinerator, water heater and manufacturers of other appliances are now sending out these plans. They are all worth the time that it takes to study them and from what we have been able to learn 1929 plans will far surpass anything that has ever before been devised.

SELLING HOT WATER SERVICE

Selling hot water service is undertaken in many and divers ways. Some gas men say: "I do not think we should sell any water heating appliance that is not automatic", while others are of the opinion that if they did not sell the circulating type of gas heater that they would be overlooking a good bet. These men reason that there are hundreds of families that are not able to afford a continuous flow type of heater and that if they are sold a circulating type they will learn the value of hot water in connection with home tasks and consequently, if they ever do hit a streak of ready money they will be far easier to sell an automatic type heater than if they had employed the tea kettle method all of their days.

These men also reason: We think it proper to sell our customers what they want, and if we do not display and sell approved types of circulating gas water heaters, they will purchase inferior types elsewhere and we will have a much harder job selling them automatic service if they ever need it. We obviously like to have our customers depend upon us for appliances of all types."

—Just as old-fashioned as waiting for hot water
Automatic Gas Water Heaters give hot water without delay, bother or thought
Are you trying to heat water with equipment that was modern in 1900?
Today, all anyone need do is turn on a hot water faucet at any time of the day or night for a cupful or gallons of steaming water. For Automatic Gas Water Heaters instantly supply deep hot water for bathing, a bountiful for shaving. There's no delay, bother or thought.
Details on replacing your old water heater with an Automatic Gas Water Heater and facts about our Special Offer can be obtained from our Representative by phoning our local office. Or—
Send for further advice—
PACIFIC GAS AND ELECTRIC COMPANY
P·G·E

In connection with advertisements featuring the two types of heaters we are reproducing on this page two advertisements that make a good job of it. Both are well laid out and written and may furnish you with an idea for your water heater advertisements during the coming spring.

B.T.U.'s Quickly Make the Water HOT
Hot water is essential to health and comfort. The industrious B.T.U.s quickly and adequately supply your hot water needs.
Gas water heaters in various types and sizes are available at your Gas Office. A liberal payment plan can be arranged, if desired.
Telephone: TRIangle 7500
The Brooklyn Union Gas Company

RESULTS REQUIRE REITERATION

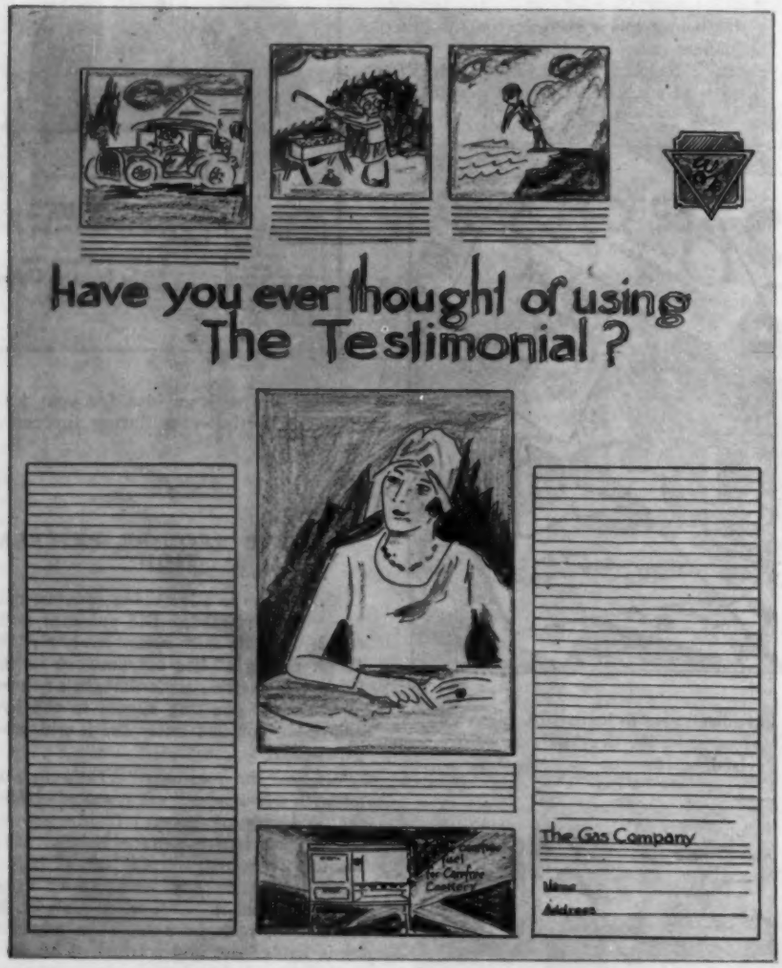
Reiteration in advertising to home managers reaps rewards. Did you ever notice that? We do not mean to imply that "cook with gas" has not outworn its usefulness, but if this same thought or theme, or whatever you may choose to call it, is enlarged upon and reiterated it will prove productive.

We hear the question; "What's the matter with advertising," oft repeated—and in the majority of cases left unanswered. Advertising has gotten to be like Mark Twain's weather; "everybody's talking about it, but no one seems to be doing anything about it," save when a slight depression in sales occurs. Then advertising is hauled out and accused of all sorts of things and there's a general and most emphatic demand to know "what's the matter with advertising?" In reviewing some of the advertising from here-and-there-and-about during the past year it occurs to us that when business was going along nicely the gas man stuck pretty close to the basic story of the benefits the home manager might derive from the use of modern gas appliances. But, during periods when business was conceded to be dull he went off on a tangent and got entirely off the track; failed to tell folks what the appliance he was advertising would do for them, with the result that he did not get the interest that he should have gotten for his advertisements to help him sell.

This question, "What will it do for me?" is asked by buyers everywhere, from N'Awleans to N'Yawk and in between and the gas man who tells 'em sells 'em.

ADVERTISING LAYOUT

Somehow no one has seemed to have gotten the idea that gas ranges, water heaters or house heating jobs might be well advertised in the 'testimonial' manner; so, being bound to get the idea of a testimonial advertisement out of our system, we have laid out an imaginary one.



This advertisement would picture some well known and justly famous local cook and it would illustrate, with a photograph, just why she preferred gas as the fuel for carefree cookery. At the top of the ad we would have three snap shots of the lady, motoring, golfing and swimming or such, with cut lines to the effect that the gasco oven regulated range premitted her to have time for all of these things and at the same time know the joy of cooking dainty dishes etc.

As for the range, we would make that subservient to "what it would do" and we would also go light on the company's signature; using it only in small, say eight point, caps just above a coupon, to be used by other women interested in learning how they might enter into and enjoy all of these pastimes and at the same time know the joy of cooking.

Indeed, no! This is not a new idea, it's merely one that is being employed for advertising everything from soap to silks and tooth paste to tobacco; that is, everything but, so far as we know, home labor saving, gas using appliances,—so, if the idea appeals to you, try it on.

WOMEN SALESMEN

In order to build up sales volume and keep down overhead a number of the gas companies outside of the metropolitan cities are employing saleswomen who devote all of their time to store sales and work that leads to sales, store arrangement and stock display, and some of them are even made responsible for window displays.

This seems to be logical, for as we view it, by and large, the patrons of the gas appliance store are largely women; therefore, why not employ women to "show-off" home labor saving appliances and

sell them to women who enter the stores? It seems that women have some new ideas about dressing-up the stores and giving them the proper atmosphere; also, that they will be more apt to seek out and find the reasons why other women will want the various appliances offered for sale.

THE 'OLD STUFF' DON'T GO!

Some one asked us the other day if we thought women read descriptive advertising—answer; if they do not, brother, the number of copy writers in this U. S. A. may as well be reduced sixty-six per-cent forthwith and some of the best merchandisers in the country are off on the wrong foot.

On the other hand how in Sam Hill are they going to know what it's all about if you do not get a description of the appliance into the advertisement. You can't picture it all very well. It is description, and a lot of it, that has put over with a great number of home managers the idea of the fallacy of "pot watching."

WINDOW DISPLAY IDEA

Here's a window display idea from our note book. This is one we planned to use in connection with a St. Patrick's Day Display. This is a two plane display, the man being in the fore-ground with a huge shamrock in the back-ground. The appliance to be a water heater, the colors in emerald green, white and Nile green. The lettering on the background to be to the effect that St. Patrick knew the value of banishing the snake—"why don't you start off right this spring and get the snake out of your furnace; have real hot water service by installing a Carefree gas water heater." A display along this line may be worked out for use during the first part of March.

Modernism

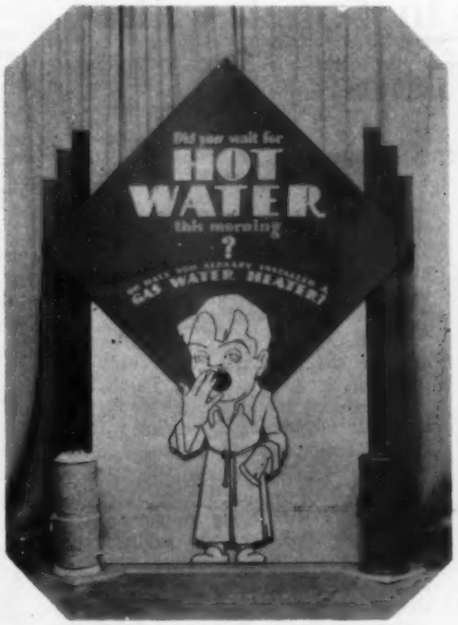
By Ray Martin

Director of Display, Consolidated Gas Company of New York

LIKE all new movements in any field of endeavor, "modernism" is, today, perhaps the most mooted and disputed, misunderstood and misrepresented form of expression. Even among authorities it is difficult to deduct a generic definition for this phase of art. There are some who consider any divergence from the accepted and precedented lines of the classic or recent periods as modernistic, while others place in this category only the more severe, extreme or eccentric innovations.

The best expression of any period is characteristic of the tendencies of that age, i.e., the thoughts, ideals, manners and customs of the era. "Modernism" is said to be the material expression of modern tendencies. It is said to interpret the machine or mechanical age, and is, therefore, the necessary art of the day.

In the writer's opinion, however, everything in this age which is progressive and significant of speed and efficiency should not be mastered under the narrow caption modernistic. They cannot be classed under that phase of modern art decidedly new in development and in a stage of incomplete metamorphosis which we shall, for argument sake, set off against things modern and call it specifically "modernistic."



Most will agree that perhaps an upper tenth of all modernistic creations is accepted as artistic. This tenth is considered to be potentially capable of evolving, in the not distant future, a more worthy and worth while type of expression. However, this upper strata is still narrow in scope and extremely limited in examples. In distinct contrast, the remainder is anything but worth while and is not a true universal interpretation of the era's tendencies. Rather, it is an interpretation of the bizarre, far-fetched, extreme and eccentric tendencies of a group that reflects a narrow phase of modern life. These exponents are not the leaders in thought, music or expression of today, but those who find refuge and a lucrative income for their unskilled, untalented and confused attempts under the guise of a new art and a new era—"modernism." Their work is lacking in balance and symmetry. They stand for an absolute disregard of the classic principles of accepted art. Their "new" art is emotionally and psychologically unsound. They jar our sensibilities—logical and artistic. They annoy and irritate the stable and ultimately fail to contribute to progress in clarifying or crystalizing a new type. We should, therefore, be cautious about accepting "modernism" until such a time when it has been perfected, and then only when it has been produced by capable artists.

On the other hand, there is a movement on foot today in newspaper and window display advertising which is decidedly modern. It adheres to the principles of good expression; it is psychologically sound; and it characterizes speed, progress, efficiency and the other tendencies of the age. The displays reproduced show more than printed words, this modern type. They are distinctive. At the same time they have unity and simplicity—two of the basic principles afore mentioned. Therefore, they are psychologically sound both from the point of view of the observer and that of the advertiser. The lettering is characteristic. It, too, is efficient and clear and so is read by the hurried observer. These displays are modern, but they do not belong to either the upper tenth of good modernistic art or the remaining nine-tenths of pseudo "modernism." They are modern in the same sense that the latest Packard straight-eight is modern.

As a last word let it be said that "modernism"—as we know it today—consists of a limited group of good interpretation, and another much larger group which is to be totally tabooed and disregarded. In support, the

following excerpt is quoted from a speech of Mr. Kenneth Collins, Publicity Director of R. H. Macy & Company, delivered at the Annual Convention of the Association of International Advertisers.

"We should be exceedingly chary of permitting any one to persuade us to go very far with the modern movement until its principles are better known. There is always a conventional way to do things, and the conventional way in our advertising, as in our lives, is usually the best. What we want in the name of modern art is simplification. What we are getting is exactly the reverse."

Are Your Ads in Touch with the Times?

By H. H. Slawson

THAT advertising man was a genius who wrote for a bakery in a large city an ad which began "Lindbergh Flies to Europe Eating Sandwiches."

The ad extolled the merits of the lowly sandwich and pointed out how the bakery in question produced just the right kind of bread to make perfect sandwiches.

The ad appeared a few days after the sensational flight of America's young hero had made "We" the most discussed subject in the world and when anything with the magic name "Lindbergh" attached was bound to attract notice. It illustrates admirably the essence of successful advertising which is Timeliness. Hook up an ad with something commanding current public interest and you can challenge the attention and interest of every newspaper or periodical reader in America.

"But how can you do that when you are only selling gas stoves, water heaters or Radiantfires?" asks someone. And J. R. Pershall of the advertising department of the Public Service Company of Northern Illinois stands ready to tell you he doesn't know of any business where there is greater opoprtunity to employ that Timeliness factor in the advertising than in the gas industry. He deplores "a merchandising laziness which fails to correlate the passing of events."

"Why doesn't a gas range make a fine Christmas present—or a gift on Mother's Day?" he asks. "Why isn't it more appropriate to advertise gas for house heating during the particular months when people are thinking about next winter's coal supply? Advertising men in the industry should leap at the opportunities they have."

He relates the story of a certain Illinois town which ran out of ice during an unusual hot spell. The ice companies at the end of three days were sold out. Food was beginning to spoil and the baby's milk had started to sour.

"Next day," he relates, "we ran a half page ad in the local newspapers on electric refrigerators, following that with a somewhat smaller ad and that week we sold as many refrigerators in that town as we had sold all year up to that time. The processes were the same, the selling arrangements were the same—there is but one reason for the result,—people were interested in refrigeration."

The illustration may be of an extreme occasion that may not repeat in a long time, but it does not, Mr. Pershall insists, exhaust the opportunities for linking your advertising campaign with the events of the passing moment.

"There is in my opinion," he declared, "a channel of human interest that does and always will, bring response. It is advertising aimed at the public, rather than at the utility executive who likes to see the size of his properties and the alleged stability of them projected and pictured in type. It is advertising that tells people something they want to know, rather than what we want them to know. Merchandise advertising finds this channel more negotiable perhaps than does the 'good-will' type.

New Buyers Teem

"Every day there is a new generation of buyers. Every time the clock ticks some home feels the need for some commodity. A million and one factors influence the progress of these wants—the weather, the income, health, the births, deaths, even the dog. Today the young couple is married, tomorrow they have their first small home, the next day the first baby comes, and by the end of the week the baby is married and the cycle starts over again.

"And where do you think we are going to break into this chain of human events with our so-called 'interesting facts about the gas business' or 'chats with the gas man?'

"But we CAN break into that chain and we CAN sell goods, too, if the subject matter of our advertising material is tuned in with the things they want to know—the things that are in their minds this week and completely out next week."

He related how his company had worked up some gas range advertising for use in the fall selling in the 6,000 square miles they serve just outside Chicago.

"Not that there is anything new in it," he said, "but please consider how much more interesting the advertising is because it carries a headline about the fall canning season, about the fruits that will be most plentiful for preserving. As a main feature of the ad consider the new canning recipe it carries, with a suggestion as to how this important household task can be done by an easy method,—meaning the use of a good gas range equipped with the latest cooking devices, which reduce the process to a half day job,

"Multiply that idea by the number of seasonal events during the entire year when people who might use our appliances are vitally interested in them and I believe we can come close to the goal we might reach.

"Call these details if you like, that need only occasional consideration, as part of a set advertising program, but my answer is that they are usually not given that consideration and any up-to-date merchandiser or advertising producer will tell you that they are the very essence of legitimate modern salesmanship. The identical theory is practiced, and successfully, by thousands of advertisers with products of a great deal less demand than gas and its outlets."

Significance of Candy Bar

He referred to the candy bar named for "Red" Grange and asked "What has a chocolate-coated cake of fudge got to do with a red-headed football player? Nothing except that more people had their minds on Red Grange at that time than on any other one subject the advertisers could think of.

"Of course we cannot go to these extremes, but we can make use of the idea and actually better use of it, because gas and the benefits it brings to homes and industries are of more permanent value.

"We are prone to think that there is a limited market for some of the appliances; that only so many people will buy them each year, and that the buying habits of the people are so regulated that we can sell certain merchandise in volume only in certain months of the year. While some of this is true, it is largely true because of a merchandising laziness that fails to correlate the passing of events. Water heaters, for instance, should have no season. Neither should ranges if the markets are analyzed and people are actually made to know that gas ranges are in some way connected with what they are doing today, tomorrow and the next day.

"And the aim of advertising is deserving of attention perhaps more in the use of direct-by-mail materials, house-to-house canvassing, and so forth, than in newspapers. Selling through the mail depends entirely upon the timeliness or appropriateness of your message, whereas in the newspapers you are always sure of a few readers.

"It is a question whether it is more futile to send out a folder or a booklet on gas for house heating in the middle of winter, when it is impossible to make a change in heating arrangements, or in the middle of summer when heat or heating is the last thing people want on their minds. Yet many of our campaigns use these months to the exclusion of others, simply because we want to fill in the gap in our sales charts, or because some other advertiser makes the same mistake.

"Along that same line of futile advertising, how futile it is to mail advertising matter on water heaters, refrigerators or perhaps gas ranges, in a town or district of thirty to sixty per cent apartment dwellers, where all these appliances are furnished to the renter.

"I mention these things not as startling discoveries in the field of utility advertising, but rather as rough hewn samples of what may be uncovered if some study and a bit of thought are put into an ad before it is written. The possibilities are different in every community, so that great things are in store for everybody if we but heed the idea of adding timeliness to our ads."

Gas baked apples possess a distinctive zest

Cooking Quality Food With Gas

By C. W. Geiger

THE Southern Pacific Company takes just as great a pride in the quality of food served to its ferry boat patrons, as it does in its good train service, its fine equipment, its reputation for safe travel. All eatables served on ferryboats must measure up to superior standards than can be fully maintained only in the Company's own Commissary Kitchens. One of the most modern commissary-kitchens operated by the Southern Pacific Company is known as the Ferry Commissary kitchen and is located on the Embarcadero just a few steps south of the Ferry Building.

It is equipped with three large gas ranges, a large gas fired stove for baking apples, a gas range for use in experimental work in the kitchen and a gas fired doughnut range.

By small recessions in the high standards maintained very considerable savings could be effected; but quality, not price, is the important factor in every Commissary kitchen product.

Take doughnuts. Great cost cuts could be gained by installing a doughnut machine. Exhaustive tests, however, demonstrated that in quality and taste the old fashioned hand-made doughnut is head and shoulders above the machine made article. Here doughnuts, French doughnuts and crullers, made by hand in the gas heated range are turned out at the rate of 300 dozen daily.

Gas ranges in Ferry Commissary Kitchen at San Francisco

Baked apples are one of the most popular food items on the Ferry boat menus, great quantities of which are baked on the gas fired range.

Then there is corned beef hash, which is made on three gas fired ranges. Deservedly or not, ordinary hash has a bad reputation. It is commonly supposed to be a last retreat for remnants of other meals. Not so, however, in the Ferry Commissary Kitchen where every plate of hash has a pedigree spotless as that of a Kentucky thoroughbred. Corned beef of a quality the average butcher doesn't even keep, along with freshly cooked potatoes is the foundation for this universally popular dish. Last year the Southern Pacific served approximately 75,000 portions.

The modern traveler expects the best of service and the best of food, he wants to eat leisurely and in comfort. If these re-

quisites are not met, he is not satisfied. The Southern Pacific Company's Ferry Commissary Kitchen has met this standard through a mastery of details—details that have to do with service, sanitation, personnel work, purchasing of supplies and economy. The Commissary Kitchen is an exceedingly mobile organization. The traveling public must be fed and standards maintained no matter how heavily the demands created by unanticipated crowds, sudden emergencies or exigencies of weather. For weather plays a leading part in what one eats. Cold days—hot meats, soup and still more soup; hot days—cold meats, fresh fruits and salads. And the Ferry Commissary kitchen is always ready with what is wanted when it is wanted. During the year the Southern Pacific served over two million meals in their steamer restaurants.

The policy of issuing supplies to the steamer restaurants in small amounts only is followed in order that the supplies used may always be fresh.

All meats and entrees are cut before being issued to the steamers, and all soup stocks, sauces, pastry, etc., are prepared in this commissary kitchen beforehand. During rush hours four men are used in the steamer kitchens, and a large force of waiters is kept busy. To feed 200 persons in a ferry restaurant in the small space of time of 19 minutes, the time taken to cross San Francisco Bay, is a remarkable feat.

A gas range is operated in the Ferry Commissary Kitchen on which experiments are constantly being made in an effort to constantly improve the food prepared in this kitchen.

One function of the commissary kitchen is to relieve the forces in the ferry boat restaurants, of as much work as possible, owing to the cramped quarters in which these crews have to operate.

The recipes used by Southern Pacific Company are the result of years of research by the world's finest chefs and many of the best have been included in a special book of recipes.

What Makes a Star Salesman?

By Special Correspondent

SPEAKING of per meter sales brings to mind methods used by salesmen to sell water heaters, of the storage or continuous-flow type, to increase the sale of gas per meter, to bring back profitable revenue per meter where rates have been scaled down.

Methods to sell water heaters have been many and the success of these methods has been varied; but not a howling success as a whole, as most gas men and many manufacturers will agree. It would be well to remember however that these methods were *to sell water heaters* and thereby hangs a tale; a tale of cutomer's complaints of high gas bills and the repossession in a large number of cases of the appliance and a resolve by the seller to slow-up on the sale of water heaters.

The way the thing has worked is as follows: A drive is staged and a number of water heaters sold; but not nearly as many as both the gas man and the manufacturer's representative anticipated. However, due to the gusto of the advertising and the Free Trial offer enough heaters are put out, as the drive opens, to pay the salesmen for the added effort for a short time,—in fact, for a possible thirty days when the customer comes in with a kick and a heater or two comes back. Then the drive is over and the gas man is off water heaters again until such time as a new lingo sells him on a "better" line. This accomplished, another drive is staged and the same thing happens over again.

Gas men know this and manufacturers know it—they both have known it for years. Yet, no one seems to have done very much about it or made any serious effort to correct the situation—until very recently.

A gas water heater, regardless of whose coat of arms it carries, or what type it may be, (we are speaking of automatic heaters) is, after all is said and done, nothing more than an appliance to furnish a constant supply of hot water at the end of the spigot, marked "HOT". It is an appliance to furnish a means of heating water and keep folks from using 20% more coal or other fuel than would be necessary to heat their homes if they could be induced to dispense with the insufferable coil in their furnaces, that was put there with the idea that it would furnish them with hot water Free.

Average man blameless

Of course you can't blame the average man for swallowing the story of free hot water, hook, line and sinker. Admittedly he does get a certain amount of hot water from the thing, but no one has ever gone to much trouble to point out the cost of it on his coal bill.

Just where the blame may rest for the failure to spread the gospel of Hot Water Service makes very little difference, and there is no use to put a bung in the barrel after the molasses has run out. The thing to do now is to decide that you want to sell hot water service, that you want the load, (approximately 36,000 cubic feet per year) that the automatic storage or continuous-flow heater will provide and plan to get the idea over.

Do as Mr. Brewer, Ruud representative, told the employees of the Peachtree Branch of the Georgia Power Company to do; "Educate the cutomer to the fact that gas is economical for heating water; he will be greatly encouraged to have desirable hot water at every hot water faucet in the house, and will eventually use more hot water than before, and consequently more gas than ever before. His hot water service will be so good that he will cheerfully pay and his gas bill should not be beyond what he is willing and able to pay. (Mr. Brewer is convinced that the customer's needs should be studied before the sale is completed.)

Customer will listen

"Given hot water service at a reasonable price, the gas customer will listen to educational talk discouraging the use of the furnace coil. This leads to the furnace coil being taken out of the furnace and the customer depending on gas for heating water in his home.

"Information used by the salesmen in educating the gas customer up to the removal of the furnace coil may be classed under two heads;—Service and Costs. Service Arguments include: 1—Better temperature regulation. Hot water from an automatic storage or automatic continuous-flow heater is just right, never too hot, never too cold; gas is dependable. 2—No rusty water from a gas water heater. 3—No annoyance from pounding in the tank due to boiling water. 4—Elimination of leaking furnace coil and danger of bursting coils in the furnace with the resulting inconvenience and danger to the house heating plant.

"Cost Arguments: House heating engineers estimate that with a coil in the furnace 20% of all the heat in the furnace goes to heating the coil.

"Salesmen who train themselves to talk interestingly and intelligently about gas-heated water and its many uses and who talk in words the prospect understands, and who use shoe leather and talk to their customers a reasonable number of times, will go far in selling gas water heaters.

"The public does not know much about the price and value of gas water heaters and needs educating in this wise. The value of the gas water heater to the customer depends upon the education of the customer to the use of convenient and abundant hot water service. Once sell the customer on comfort, convenience, dependability, and economy of gas-heated water and he is going to have it."

Mr. Brewer knows whereof he speaks, as gas men here and there are aware of the fact that he has been instrumental in selling a tremendous amount of hot water service in the South Atlantic states. It may be profitable to try some of his plans, for star salesmen, after all, are those who sell the customer service.

BOONE-

-CHILTON

To further improve the quality of one of America's finest gas coals, the Boone County Coal Corporation has installed a coal preparing plant, which now enables this company to offer its BOONE-CHILTON Gas and By-product Coals with remarkable uniformity and with a one to two per cent lower ash content than is attainable by hand picking.

BOONE COUNTY COAL CORP-

450 Bullitt Building
Philadelphia

205 W. Wacker Drive
Chicago

Suitability -- Value

This cleaning plant has been designed and installed in order to make possible the preparation of a gas coal which will meet the highest standards and most severe requirements of coal carbonization----as to gas yield, coke yield, coke structure and ash content.

Here is an exceptional combination of suitability and value; back of these is a record of service evidenced by the uninterrupted supply to over one hundred gas plant customers.

Wherever there is carbonizing problem BOONE-CHILTON gas coals merit investigation.

Water Gas
Coal Gas
By-product

Produced and sold
by the Boone County
Coal Corporation

BOONE-CHILTON

GAS COALS

BOONE COUNTY COAL CORP.-PHILADELPHIA-CHICAGO

450 Bullitt Building
Philadelphia

205 W. Wacker Drive
Chicago

Interesting Home Makers

ONE of the stunts gotten up by the Portland Gas and Coke Company to draw people into their new salesroom in Portland, Oregon, was the securing of the exhibits in "Bake a Cake Sweepstakes" Contest with $2,000.00 in prizes sponsored by a leading Portland Theatre and one of the afternoon newspapers.

Although not many people are shown in the picture, one gets an idea of the tremendous daily display of cake entries. Many of the women were shy of being in the picture the minute the photographer set up his camera, and those at the end of the aisles are principally the women in charge of the selling of the cakes for charity purposes.

All the appliances were moved out of the center aisles as shown in the picture, to make room for the thousands of cakes which were entered during the week of the contest. Back of the women in the picture and facing the street was the latest Smoothtop in green and cream color which was one of the prizes given for the contest. On the far side was the Radiantfire, which was a second prize.

One of the principal benefits of this display was to get into the store the very women who were interested in cooking. They were neither the ones who were do-less or impoverished nor were they the rich who could afford to have maids, but from a Gas Company sales-standpoint, they were the cream of the cream for the purchase of Gas ranges.

A Novel Idea

THIS idea may not be entirely new, but the wonderful results obtained from it may give others encouragement in trying it out, especially if the gas company happens to be located in a smaller community. This stunt will not sell any new gas appliances, at least no direct sales, but it is guaranteed to build up a lot of good will and result in a lot of free advertising and more than pay for itself in these two very important commodities.

The particular gas company started a corn club all its own. Now corn clubs are not new in Indiana, but one sponsored by a gas company is rather a new idea. The gas company provided the seed corn and each of the 27 employes in the office and sales force of the company sponsored some farm school boy as his particular protege in the club. The names of the miniature corn growers were provided by the county agricultural agent.

Each boy thus recommended was given a bushel of corn for seeding purposes. A provision was made that out of his crop he was to turn over to his sponsor 60 ears of corn from the crop. This cut down the initial cost of the stunt and these 60 ears, slightly more than half a bushel, meant little to the boys.

When the harvest was completed, the county agent, together with other good corn judges, selected a bushel of the best corn from each of the growers and this was taken to the gas company's office, a total of 27 bushels. This corn then was judged by the regular corn judging team of the county and the first, second and third best bushels were selected. These bushels were given extra cash premiums by the company, the prizes being $10, $5 and $3.

Following the judging of the corn, a big auction was held at which the entire 27 bushels were auctioned off to the highest bidders for seeding purposes. The prize bushel brought down $28 and the next two $26 each. And this is some price for even championship Indiana corn. The boys, of course, got this money. The auction of only these 27 bushels brought the little growers nearly $500 in actual cash and the company a lot of free and favorable publicity.

The remainder of the crop was sold in the usual manner. It so happened that in each case the boy made more off his corn per acre than his father did during the season.

And the 1,620 ears of corn the company got as its share sold as seed corn for about three times the regular price. The actual cost to the company was very small when the value received in advertising and good will was considered.

Don't Be a Sap

AT THE Dufwin Theatre, Portland, Oregon, the other night, where the Henry Duffy Players presented the comedy "The Sap", the following article caught my eye during intermission:

"THE SAP"

"For years I was a 'sap' and when trouble entered the door I was unprepared to meet it.

"The other day trouble again took the liberty to visit my home. It is rather secluded and away from the populous districts so that I worked in vain all evening to locate a doctor in my locality and could not reach my own physician.

"The next day, however, like a godsend, an experienced, graduated nurse, who is running a private hospital on the East side, had an inspiration to call up and see how we were. Of course, she was invited to come over post-haste and found the wife much more serious that I had believed, with a high fever.

"She had to put on hot and cold fomentations and needed not only piping hot water but ice. I used to be a sap and like others perhaps, imagined that one did not need refrigeration in winter. Where to get ice in my outlying district would be a puzzle, especially at that time of day, but fortunately I had ceased being a sap and had been persuaded that refrigeration is essential for the comfort and health of one's family. When the Gas refrigerator was invented (which had the additional advantages of being absolutely noiseless and on account of having no moving parts whatsoever, promising to go on year after year without repairs staring me in the face), I installed an Electrolux Gas Refrigerator. Of course, it had been nice to have our food keep sweet and not to have to throw out so many things on account of becoming spoiled, but here in this particular case, when the nurse said 'ice,' we had it on hand and plenty of it. All I had to do was to take the ice trays out, run a little hot water on the back

of them and there I was with a bowl full of beautiful cubes of ice.

"When the nurse wanted piping hot water, my much beloved Ruud Autohot Waterheater was on the job and no matter how fast the nurse used up the hot water, the Autohot was equal to the occasion.

"Expense? Yes, of course. You don't suppose you can have ice on hand and your food kept sweet in your refrigerator without paying something for such a luxury? The cost of my gas refrigerator will run about 5 to 6c a day, as it only takes a tiny little gas flame and a trickle of water. As for the hot water, with a delightful hot and cold shower every morning, the hot water on tap on every floor, for washing dishes or cleaning, shaving or what not—sure, that costs money but isn't it worth 10 or 15c a day or even 25c a day to have such comfort day and night? Of course, it is.

"From experience, therefore, I can now testify that when an emergency arises like sickness, the gas bill for a whole month is something to snap your fingers at, because when you want the convenience you are willing to pay most any price, so that the actual cost of gas for these purposes dwindles when compared with the importance of meeting the emergency.

"MORAL: Don't be a SAP but let the Gas Co. furnish you too with these wonderful modern conveniences."

Inquiring from the Advertising Department of the Gas Company, I learned that the story which interested me so much in regard to the advantages of the gas Refrigerator and automatic Water Heater was not someone's fancy, but was based on the actual experience of Mr. Hartog, Manager of the Sales and Advertising Department.

Home Service Director Helps People Give Parties

By Frank H. Williams

IT PAYS the gas company to appeal strongly to those people who are going to give parties.

If you don't believe it, ask the Southern Counties Gas Company, which supplies gas to a considerable number of growing communities in Southern California.

This concern has a Home Service Director in all of the larger towns it serves and this woman will plan menus, teach people how to cook appetizingly for the party and help to make the whole entertainment a big success. She is in constant demand for this service.

The Southern Counties Gas Company cashes in on this service by every now and then running a four column ten-inch newspaper advertisement reading like this:

"ARE YOU GOING TO HAVE A PARTY?

"Do you expect to serve refreshments at your next club meeting?

"Are you planning a little social gathering of friends soon—a gathering of the sort at which you may serve anything from simple informal refreshments to a formal dinner or luncheon?

"PERHAPS OUR HOME SERVICE DIRECTOR COULD HELP YOU.

"Are you having a little difficulty with your range; does the oven bake as well as you would like to have it; would you get a little better results if the broiler was adjusted? Do some of your favorite recipes go wrong every now and then?

"Let the Home Service Director know about it. She will call on you, discuss your difficulty, find where the trouble lies and help you to solve it.

"Would your daughter and her friend like to have a few cooking lessons by an expert who can teach them many labor-saving methods and give them many helpful hints on household management while giving lessons in practical and fancy cookery?

"Our Home Service Director Would Be Glad To Do This.

"THERE IS NO CHARGE FOR THIS SERVICE.

"This is just a part of our equipment for service to the gas consumers of Orange county. Let gas and modern gas appliances help you to live more comfortably and economically.

"WE RECOMMEND THEM.

"For the benefit of our customers we carry in our offices a supply of modern gas appliances which have been tested and approved by the highest authorities in the gas industry.

"We know these tested and approved appliances will give you good service at low cost.

"Refrigerate with gas—the heat that freezes. Keep youthful and fresh with the daily bath—warmed to just the right temperature with gas.

"Let the modern gas range with its automatic heat control save you time, worry and money.

"WE ARE BACK OF THE APPLIANCES WE SELL.

"Southern Counties Gas Company.

"'Modern Homes Use Gas.'"

It is the experience of this company that every time it uses a newspaper advertisement of this type the response to it is very good indeed. There are always some perturbed hostesses who are glad of the home service Director's aid in making their parties more of a success and, of course, there are constant calls from young matrons and from other people for the home cooking lessons which the director gives to those who want them.

This service is a distinct asset to this concern in increasing general good will for the company and in inducing greater use of gas by consumers.

The Economy of Advertising

Both from the practical and the theoretical viewpoint advertising has a staunch defender in William Butterworth, President of the Chamber of Commerce of the United States as well as the head of one of the country's large manufacturing concerns.

"One still hears," he said in a recent address, "the occasional voice of a dissenter charging advertising with wastefulness. That complaint which, by the way, is similar to those one hears directed against every other line of human endeavor, rarely if ever, comes from those in business who understand and work with advertising. The charge of wastefulness is true in regard to only a part—a very small part—of modern advertising.

"A business man who thinks advertising is a magic formula is likely to waste his money. But I am convinced that most of the advertising of today is a sincere, informative service which, upon the whole, has the appreciation and confidence of the buying public. It is mass selling in tune with the mass production of today."

Utility Service Only 6% of Living Cost

Only six per cent of the income of the average family in the United States is devoted to the purchase of all public utility service used, according to a recent analysis of family expenditures, says the New York State Committee on Public Utility Information.

The six per cent spent for utility service is divided approximately as follows:

Transportation	2.00	per cent
Telephone	1.26	" "
Gas	1.08	" "
Electricity	1.03	" "
Street cars	.42	" "
Water	1.21	" "

Other items in the family budget are estimated to consume these percentages of income: food, 45%; rent and taxes, 16%; recreation, literature, charities, 14%; clothing, 12%; miscellaneous items, 7%.

The items composing 94% of average family expenditure are those which have advanced most radically in cost in the past decade. The utility service items show either a decrease in cost over this period or very small increases.

Getting Off to a Good Start

THE cooking schools held in Bellefonte and State College, Pennsylvania for the Central Pennsylvania Gas Co. combined the educational lectures and food talks. Gas was turned into the two towns the first of December, and a day later, Mrs. Luella M. Fisher, National Home Service Director of the Eriez Stove & Mfg. Co. and her assistant, Miss Grace Rebman Preston began to instruct the high school pupils of Bellefonte and State College on the correct use of gas so that they might carry the news home.

The high school lectures were followed by similar talks at Penn State College and the same set-up was used for all, that is, a gas meter, manifold connecting water heater, radiant type of fire range, and refrigerator was demonstrated and explained, together with the reading of the gas meter dial. Altogether Mrs. Fisher and Miss Preston between them, talked to over 1100 students.

Luella M. Fisher

The following week the usual Eriez educational schools were given at Bellefonte by Mrs. Luella Fisher and at State College by Miss Grace Preston. The classes were held for four afternoons from Tuesday to Friday with one evening meeting for educational gas instruction. About 400 people were present at the cooking school in each town.

One lady in the audience said: "Our Gas family was divorced over seventeen years or more ago and everyone is happy over the fact of a recent marriage that somehow has given Bellefonte and State College the chance of using gas again."

To one who has never known of any fuel other than gas, the startling looks that come over the weary countenances of tired women as they watched the gas appliances demonstrated is a revelation. For they have been trudging coal for cooking, waiting for the kettle to boil on the electric range and scouring smudges from pans used on oil stoves.

Here are a few of the comments received:

"Just push the button and all four burners will light at once? Why, I cannot believe my eyes."

"You say I can put my dinner in the oven and be gone all afternoon? Well, the doctor has told me I should go away for a rest. Why do it now when I can rest in my own home."

"Tell me again about this water heater. Did you say just light this little pilot light and that everything will take care of itself? Oh, will wonders never cease! Then to think that neither father nor I will need to stoke the furnace. Just work the little clock in the living room."

"Yes, did you say that it would be necessary to turn the radiant type heater on and off, but that will not be any bother for I will need to use it only in the spring and fall when the house heating plant is shut off."

"When I get to know the use of these other appliances I want the refrigerator and that laundry dryer; yes, and that affair you burn the garbage in."

Big Increase in Use of Gas for Heating Houses

The use of gas for heating homes in New England shows an increase of almost 50% over 1927, the total on October first (as reported by 68 companies representing the bulk of the industry) being 3,366 installations, against less than 2,300 at the same time the previous year.

Massachusetts leads all other states in New England with a total of 2,260 installations, the majority of which are located in Boston and vicinity. Rhode Island is second with 630, New Hampshire has 127, Maine 125 and Vermont 24. Three years ago there were less than 500 installations in the whole of New England. In 1926 the number had risen to 1,200, and in 1927 to nearly 2,300.

The increasing use of gas for house heating has developed a somewhat different type of dwelling, by the incorporation, in the walls and roof, of insulating material designed to conserve every possible heat unit for the purpose of keeping down the cost of heating.

Another difference in the construction of houses is found in the treatment of cellars, which heretofore have been used principally for the storage of coal and rubbish. With the advent of gas heating, this space becomes available for living purposes, being entirely free from dirt and dust, and with the high cost of building construction, means that extra rooms can be utilized with little, if any, additional cost.

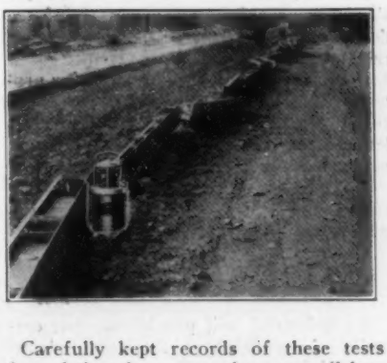
The majority of the New England gas companies have established special rates for gas for house heating.

Equipment News

Portable Warning Flasher

A portable electric warning flasher, the first ever perfected, has recently been placed on the market by National Carbon Company, Inc., makers of Eveready batteries and sponsors of the famous "Eveready Hour." The new signal is known as the Eveready Portable Flasher.

One of the remarkable features of the flasher is its demonstrable economy of operation. Research experts of National Carbon Company for more than a year tested the new device and claim that it operates more cheaply even than oil lanterns and gives far greater security because of its powerful intermittent warning.



Carefully kept records of these tests showed that the average kerosene oil lantern costs not less than $50 a year for filling, cleaning, replacement of chimneys and depreciation.

While the first cost of the Eveready flasher is considerably more than the initial cost of the oil lantern, its maintenance is so much less over a considerable period of time that it saves its cost and then makes steady reductions in upkeep.

Another distinct advantage of the flasher is the fact that it is readily portable, the entire unit, fully equipped with batteries, weighing only 16 pounds. The batteries used are standard 6-inch Eveready Columbia Ignitors, and are universally obtainable for replacements. The intermittent flash uses the battery capacity to best advantage, making them last much longer than they would under a steady load. It is estimated that the new flasher, operating steadily, will cost only $10 a year to keep charged.

The specifications of the new signal warning are: Height, 16 inches; diameter of base 7 inches and weight, including batteries, 16½ pounds.

Once it goes into operation, the flasher, it is claimed, requires no attention whatever except to replace batteries every two or three months. It requires four standard Eveready Columbia dry cells connected in series to deliver 6 volts. An ex-

tra six volt lamp is inside the battery housing. The battery compartment is constructed in seamless steel attractively finished in red and the top is cadmium plated for weather protection. The heavy Fresnel-type red glass lens throws a powerful warning beam. The padlock for the battery compartment has an extra long hasp so that the flasher can be chained and protected from theft. The rugged construction throughout makes the whole signal completely weatherproof.

Improved Welding Gloves

Oxweld Acetylene Co., 30 E. 42nd St., New York City, has added to its line of accessories for oxy-acetylene welding and cutting, gauntlet gloves of a soft and pliable suede leather, specially treated to prevent heat from affecting it, to supersede the Oxweld horsehide gloves formerly supplied.

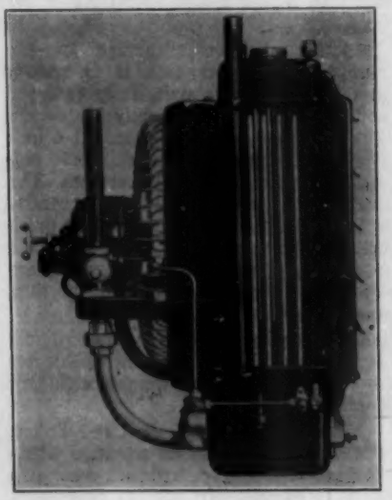
A leather strip on the thumb seam and a semi-circular reinforcement on the inside seam adjoining the palm reinforce the glove. The left glove has a leather reinforcement, covering the entire back between the fingers and gauntlet, for protecting the back of the left hand during cutting operations. A close fitting gauntlet protects the arms. The reinforcements tend to make them very durable.

It is claimed these gloves will not stiffen or shrivel from the application of heat or from soaking in water.

New Industrial Unit Gas Heater

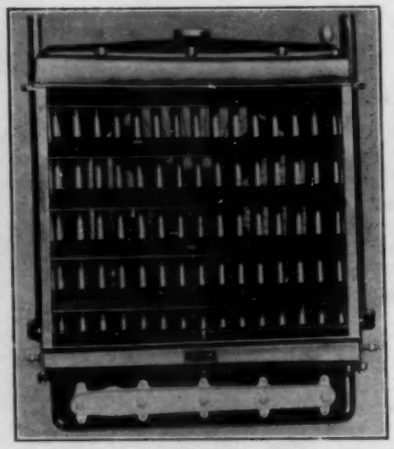
An industrial unit gas heater that embodies, in addition to the usual advantages claimed for such equipment, some entirely new and unusual features of low initial cost, economy, efficiency and compactness, has just been put on the market by the General Gas Light Company, of Kalamazoo, Michigan.

The special advantages which are claimed for this heater, which is known as the Humphrey Industrial Unit, are due chiefly to the use of gas as a fuel, which renders it available for many purposes hitherto unknown to heaters of the same general type. Heating capacity of each unit is approximately the equivalent of 400 square feet of ordinary steam radiation, the heater fan delivering 1,800 cubic feet of heated air per minute.



Side view

Although similar in appearance to most others of its kind, the Humphrey Industrial Unit is entirely self-contained. No connection is needed except the pipe which conveys gas to the burner and no boiler equipment is required. For this reason no heat is lost by conduction through the walls of steam pipes. And for the same reason the Humphrey Industrial Unit is elastic in application, easily moved when it becomes necessary to change its position to make way for rearrangements of factory space. In addition, the Humphrey Industrial Unit is designed to be hung from the ceiling, as it is primarily intended for heating large spaces. Thus low installation and removal cost is claimed, together with cleanliness and economy of operation, and an absolute minimum of space requirement.

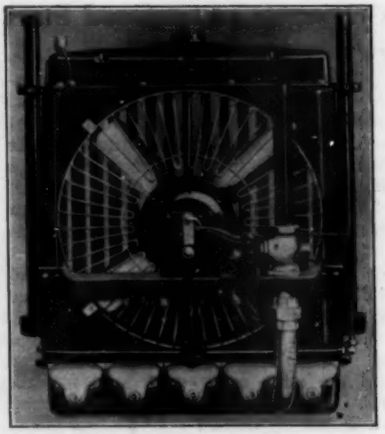


Front view

The heater operates as follows:

Above a bank of special Ni-Chrome gas burners is a battery of brass tube radiators, so arranged that heat from the burner is equally distributed up through the tubes, the combustion products being carried away by a perforated cap flue, or a ceiling flue if the room to be heated is small. Behind the tubes is a fan, propelled by a 1/6 horsepower motor. Air drawn in by the fan is driven across the heated tubes. Louvers at the front deflect the heated air to any desired level. The fan also delivers air under pressure to the burner box, thereby increasing burner efficiency.

Heat control can be maintained by a thermostat, arranged to actuate the motor; the motor in turn being equipped with a governor that turns the gas on and off as required to support an even temperature. Pilot lights on either side



Rear view

of the burner, which take care of ignition, control a simple thermostatic switch that automatically prevents the motor from operating in case the pilots are extinguished, and keeps it, and consequently the gas supply, turned off until the pilots are relighted.

Thus it is entirely practicable to operate Humphrey Industrial Unit heaters over long periods with virtually no attention.

If less heat, or no heat at all, is desired during certain hours, the thermostat indicator may be set to meet the requirement. Then when the indicator is reset at a higher degree, the desired temperature is attained in a very few minutes.

Upkeep consists solely of oiling the moving parts and cleaning the radiator tubes from time to time. As the burner unit swings down upon hinges, no difficulty is encountered in reaching the tubes. Moreover, all parts of the Humphrey unit heaters are independently removable in the rare event of replacement.

Owing to the fact that Humphrey equipment requires no steam boiler connection, no licensed fireman is needed, and the dirt and inconvenience of handling solid fuel is obviated. This makes Humphrey unit heaters especially desirable for plants where steam is not required for other purposes, and for stores, warehouses, garages, dance halls, auditoriums, churches and drying rooms of every description.

When all factors are considered, its makers claim the Humphrey Industrial Unit gas heater will heat efficiently a greater area at less outlay of money and trouble than any other offered.

Additional details upon request.

Renrut Service Cleaner Made in England

The Renrut Service Cleaner which was described in the January, 1929 issue of the American Gas Journal, page 80, is manufactured by Abbott, Birks & Co., of London, England. It is imported by Safety Gas Main Stopper Company for sale in the United States.

Recent Higher Court Decisions Involving Gas

By Leo T. Parker

IT IS A well recognized fact among law experts that the majority of litigations may have been avoided had the litigants acquired elementary principles of the law.

Obviously, gas officials and executives cannot obtain knowledge of all branches of legal procedure and at the same time prove adept in their own business. However, when it is considered that gas companies are subjected to pitfalls of litigations arising from comparatively few sources, it is easy to realize that acquiring sufficient legal knowledge to successfully avoid the majority of controversies is not difficult.

Legality of High Gas Rate Upheld

In many instances gas consumers have instituted legal proceedings to compel municipalities to supply gas at the same price it can be purchased from other nearby sources.

However, it is important to know that generally a city ordinance specifying the rates which shall be paid by consumers for gas is valid and enforceable, although the same quality of gas may be obtained at lower prices from companies located outside the city boundaries.

For example, in City of Winfield V Wakefield, 271 Pac. 392, it was held that a person who purchases gas from a municipality at a higher price than he can buy it from a gas company located outside the city limits, cannot avoid payment to the municipality at the agreed price.

The facts of this case are that a citizen requested permission of the city council to lay a pipe line from the city limits to his property in order to convey gas from the pipe lines of a gas company which had no franchise to supply gas within the city limits.

The city refused this request and the property owner was compelled to use gas supplied by the municipal gas plant at 20c per thousand cubic feet, when he could have purchased it from the company located outside the city at 8c per thousand cubic feet.

He refused to pay the city for the gas consumed contending that it should have been supplied at the same price that he could have purchased it from the nearby company.

The city filed suit to collect the account and the Court held the consumer bound to pay for the gas at the regular price charged by the city, saying:

"Defendant's (consumer's) liability was established when he admitted that he purchased and obtained gas from the city at the uniform price at which it was furnished to other customers within the city, and had failed to pay for it . . . . and did not claim that any payment had been made other than was alleged by plaintiff (city), and had not pleaded and set-off as against the claim of plaintiff. The fact that he could have purchased gas at some point outside of the city at a lower price was not a defense to a claim for an article which he actually bought at a stated price knowing it to be the price charged all consumers within the city. There was no discrimination against him, as the fuel was sold to him at a price established by an ordinance which placed him on an equality with all citizens and consumers. His protest made at the time of the purchase was immaterial, and there was no coercion, as he was at liberty to purchase or decline to purchase the gas at the standard price, and he was at liberty, also, to use other fuel in his drilling operation. His request for the right to lay a pipe line through the streets and alleys may have concluded fuel from an outside pipe line company and the granting of such a right, was a matter within the discretion and control of the governing body of the city. That body, which has supervisory control of streets and alleys of the city to obtain that the welfare of the city would not be promoted by allowing its streets to be torn up and pipes laid in them to enable an outside company to furnish gas to a single consumer in the city."

Ordinance Held Valid

In the recent case of Citizens Pipe Line Co., V Twin City Pipe Line Co., 10 S. W. (2d) 493, a city ordinance was held valid which granted the right to a gas corporation to lay pipes in the city streets, although the corporation was not organized when the ordinance was enacted. Moreover, the gas corporation was not required to pay 2% of its income to the city, as was required in the franchise granted another gas company several years previously.

The facts of the case are that the Twin City Pipe Line Company had for several years operated in the city of Fort Smith, Arkansas, under two franchises, neither of them granting the exclusive right of supplying gas to domestic consumers and industrial plants in the city. By the terms of its franchises, it was required to pay 2% of its gross revenues in consideration of the franchise.

The city council enacted an ordinance granting to a competitor, the Citizens Pipe Line Company, the right to construct, lay, own, and operate a six inch gas pipe line, from the city limits to the Harding Glass Company's plant to supply it with gas. The Citizens Pipe Line Company was not required to pay 2% of its revenues to the city. Moreover, this ordinance was passed before the Citizens Pipe Line Company was incorporated.

The Twin City Pipe Line Company filed suit contending that the ordinance was invalid because it did not require the Citizens Pipe Line Company to pay 2% of its income to the city, and also because the ordinance granted a privilege to a company not in existence when the law was passed.

The lower Court held the ordinance void, but the higher Court reversed this verdict permitting the Citizens Pipe Line Company to construct its mains and supply gas to the glass company, saying:

"It is also true that grants from the sovereign power are to be construed strictly against the grantee and in favor of the city or government making the grant. . . . While the testimony shows that appellee company (Twin City Pipe Line Company) is required under the terms of its franchise to pay to the city 2% of its gross revenues derived from the sale of gas, it cannot complain that this is an illegal exaction on the part of the city, since it voluntarily contracted to pay such percentage of its revenues to the city in consideration of the grant of its franchise. . . . It may be said that, even if the corporation (Citizens Pipe Line Company) was not organized before the passage of the ordinance, the permission had been applied for by those whom represented it in petitioning the city council, and it was accepted by these individuals for the corporation as 'president' and 'secretary', and the corporation was legally organized *before* the expiration of the time granted for acceptance of its terms by the ordinance, and the same persons who accepted the ordinance were elected president and secretary of the corporation."

Gas Company Liable for Injury

Generally speaking, a gas company is liable for injuries caused by explosion of gas which leaks from its mains, providing convincing evidence is introduced to prove to the satisfaction of the Court that the company was negligent in failing to repair the defect causing the leak.

For illustration, in Cracraft V Wichita Gas Co., 271 Pac. 273, it was disclosed that a plumber met his death through an explosion which entirely wrecked the building in which was a grocery store. The facts developed by the evidence indicated that gas entered the basement of the building, in which the store was operated, through a soil pipe connecting with the city sewer, and that the gas escaped into the basement through holes cut in the soil pipe. It was ignited by a match or candle in the hands of the

plumber who had been employed by the owner of the store to make repairs.

In holding the gas company liable, the Court said:

"Following the explosion, a kind of vapor was observed rising from a vent pipe. This was lighted and burned steadily to a height of about 18 inches. Immediately after the explosion the defendant company (gas company) began work on its lines in that vicinity."

Increased Gas Rate Disallowed

Frequently, the higher Courts refuse to allow requests for increased gas rates primarily because the gas company fails to supply detailed accounts of various listed expenses; or exaggerates the true value of its real estate; or requests allowance of unusually high interest for depreciation and amortization.

Obviously, if a Court discovers a material discrepancy in the records upon which the request or the increase is based, the statements of valuation, expenses, and other items, upon which no direct check is possible, are viewed with suspicion.

In other instances, the mere fact that the gas company fails to prove listed expenses and valuation prevents a Court from allowing the desired increased rate, because there is no foundation upon which the increased rates may be justifiably granted.

The recent case of Hominy Light & Gas Co., V State, 267 Pac. 235, contains unusually valuable legal information on the subject of rate making. The facts of this case are that on August 26, 1924, the Hominy Light & Gas Company filed application with the Corporation Commission for authority to increase its domestic gas rates within the city of Hominy, Oklahoma. In December, the commission entered a temporary order permitting the company to increase its rate from 40 to 50 cents per thousand cubic feet, effective December 1, 1924, with a provision for refund of excess collections in event the commission should find upon final hearing that the company was not entitled to charge the full 50-cent rate. It was further ordered that the Hominy Pipe Line Company be made a party to the action, because the latter company operated a transmission system transporting gas purchased in the field, and delivered the same to the distributing company at Hominy.

Various hearings were had before the commission which resulted in an order by the Corporation Commission on April 6, 1926, fixing a rate of 47 cents per thousand for the first 50 thousand cubic feet per month, and all in excess thereof 25 cents per thousand cubic feet.

The gas company not being satisfied appealed to the Court for allowance of a straight 50 cents per thousand cubic feet. It presented items of expenses under the title of "Miscellaneous Expense" without itemizing the expenses, and the rate value greatly exceeded the actual cost of its real property. Also, the company contended that its rate of interest for depreciation and amortization should be 12 to 15%, whereas the commission allowed only 5%.

It is interesting to observe that the Court, in refusing to allow the 50-cent rate, stated important law, as follows:

"We have examined the two exhibits, but are unable to find therein the additions or betterments claimed, unless part thereof be included under 'Miscellaneous Expense,' *not itemized* and sought to be charged as operating expense. . . . The finding and judgment of the commission are presumed to be correct, and the burden is upon the plaintiff (gas company) to establish its cause. In a proceeding instituted before the Corporation Commission by a public utility for the purpose of having established a rate to be charged by it for the service rendered, it is incumbent upon such public utility to establish by competent evidence the fair and reasonable value of its property used and useful in the public service at the time of the inquiry. . . . There was considerable latitude between the book value or actual cost of the property and rate value. . . . The value of the property for rate-making purposes is the reasonable fair value of the property as the same exists at the time the inquiry is made . . . . consideration must be given both to original cost and present reproduction cost, less depreciation, together with all the other facts and circumstances which would have a bearing upon the value of the property. . . . The commission, upon the valuation fixed, and cost of operation, estimated a sufficient rate to allow 8 per cent. interest to stockholders on their investment, and 5 per cent. interest for depreciation and amortization. . . . It was contended by plaintiff (gas company) that it was entitled to a rate of from 12 to 15 per cent. for depreciation and amortization. . . . This would, no doubt, be true, if the company had but recently started its business. . . . In order to arrive at a reasonable and just allowance for this purpose it is proper to take into consideration the age of the company and and its fiscal history."

Exclusive Franchise not Presumed

It is important to know that in the recent case of City of El Dorado V Coats, 299 S. W. 355, the higher Court held that the word "exclusive" never is presumed to have been intended to be included in an ordinance granting a franchise to a person or firm to supply gas to the inhabitants of the municipality.

The facts of this case are that the Central States Gas and Electric Company owned a twenty-five year franchise to supply gas to the consumers in El Dorado, Arkansas. Five years after its franchise was granted the city council enacted a second ordinance granting a franchise to another gas company to supply gas to the inhabitants.

The Central States Gas and Electric Company filed suit contending that it had the exclusive right to supply gas to the inhabitants of El Dorado because while the franchise did not expressly grant the exclusive right, yet an exclusive franchise was implied because the ordinance required the payment of 2% of the gross receipts to be paid to the city, and obligated the Central States Gas and Electric Company to furnish gas free to the city for its hall and prison without reserving to the city the right to enter into a similar contract with any one else.

However, since the word "exclusive" was not included in the ordinance, the Court held council within its rights in granting a franchise to the competitive company, saying:

"In this country, as in England, every grant from the sovereign power is to be construed strictly against the grantee, and in favor of the city or government. The rights of the public are therefore not to be presumed to have been surrendered to a corporation, *except so far as the intention to surrender them appears in the charter.* . . . A state or council ought never to be presumed to surrender this power, because the whole community have an interest in preserving it undiminished; and, when a corporation alleges that the state or council have surrendered its power of improvement and public accommodation, abandonment ought not to be presumed in a case in which the deliberate purpose of the state or council do not appear. . . . If no exclusive right was conferred, then the second ordinance, which granted the franchise of the same rights to the appellant company, is valid, because no obligation of contract was impaired."

Franchise Held Valid

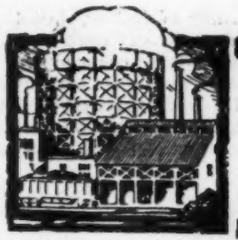
Generally speaking, state laws which regulate advertising a proposed law, with respect to franchises, is considered in its entirety, irrespective of other general laws.

For instance, in City of Wichita V Wichita Gas Co., 271 Pac. 270, it was shown that a Kansas state statute provides that "franchises shall not be granted until notice of the proposition to grant the same has been given for twenty days by publication in some newspaper in general circulation in such city, and if within said twenty days 10 per cent. of the legal electors petition such city authorities to submit the same to a vote of the electors of the city, such city authorities shall submit said franchise proposition to a vote of the people before such franchise be granted and be governed by result of such vote."

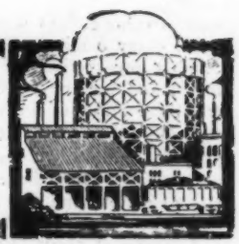
Another law of the state provides that an intended grant of a franchise shall be advertised for twenty-one days.

In 1922 a franchise was granted to a gas company in Wichita after it had been advertised for twenty days. Later, litigation developed involving the va-

(*Continued on page 84*)



NEWS OF THE GAS INDUSTRY



Michigan Gas Companies to Spend Large Sum this Year

Michigan gas companies are planning to spend close to $9,500,000 in 1929 in extensions, plant enlargements, and improvements, according to a recent compilation of budget figures made by the Michigan Public Utility Information Bureau.

During 1928, Michigan used approximately 34,800,000,000 cubic feet of gas as compared to 31,153,000,000 cubic feet in 1927. This gain of 11.7 per cent, is indicative of the strong advancement gas is making in its present day field, that of heating—industrial, commercial, and domestic. Appropriations included in the $9,500,000 total look toward a corresponding advancement in 1929.

The year was marked by the increased use of gas in such Michigan industries as automobile manufacture, the heat treating of steel, forging, riveting, tempering springs, testing new motors, baking foundry cores, vitreous enameling, baking japan, toasting cereal foods, roasting coffee, the wholesale baking of bread, hardening tools, and many others.

Gains in domestic consumption reflect the increased use of gas for house heating, water heating, incineration, and refrigeration.

An outstanding feature of 1928 was the carrying of gas to 40 Michigan communities that never before had a gas supply. This was due largely to recent developments in gas distribution which have made it possible to send gas considerable distances through high-pressure mains. Michigan companies have taken advantage of these developments to radiate gas from central plants to outlying communities as far away as 10, 20 or 30 miles. During the past year, 345.8 miles of high-pressure mains were laid to serve the 40 added communities. Budget plans for 1929 include provisions for 300 miles more of high-pressure mains to serve 30 or more other suburban settlements, villages, and towns. These high-pressure extensions are in addition to local main extensions.

The various gas companies are planning to add a number of new towns to the list in 1929.

All but a very small part of the 34,800,000,000 cubic feet of gas used in Michigan last year was manufactured gas. During the year, natural gas entered upon the scene at Muskegon. Domestic and industrial users at Muskegon and Muskegon Heights are now served with natural gas from the Muskegon field. Natural gas discoveries thus far made at Muskegon do not indicate, in the opinion of state and federal geologists, a supply large enough to export to other communities, or even to take care of Muskegon's own demands for more than a comparatively short period.

Convention Calendar

FEBRUARY

14-15 Mid-West Regional Sales Conference, sponsored by the Mid-West Regional Sales Council and the American Gas Association. Commercial Section. Chicago, Ill. John West, American Gas Asso., 420 Lexington Avenue, New York City, secretary.

MARCH

5-6 Ohio Gas and Oil Men's Association, Annual Meeting, Columbus, Ohio.

12-14 Oklahoma Utilities Association. Annual Meeting, Oklahoma City, Okla. E. F. Mackay, Oklahoma City, Okla., manager.

14-15 Illinois Gas Association, Annual Meeting, Springfield, Ill. George Schwaner, 305 Illinois Mine Workers Building, Springfield, Ill., secretary.

APRIL

3-5 Distribution Conference, Technical Section, American Gas Association. Boston, Mass.

10-11 Pennsylvania Gas Association. Annual Meeting, Benjamin Franklin Hotel, Philadelphia, Pa. G. L. Cullen, Harrisburg, Pa., secretary.

15-17 Mid-West Gas Association, Annual Meeting, Minneapolis, Minn. A. W. Schmitt, Mid-West Gas Association, Des Moines, Iowa, secretary.

23-25 Southern Gas Association, Annual Meeting, Memphis, Tenn. J. P. Connelly, 141 Meeting Street, Charleston, S. C., secretary.

24-25 New Jersey Gas Association. Annual Meeting, Trenton, N. J. Louis Stoecker, 80 Park Place, Newark, N. J., secretary.

Memphis Now Using Natural Gas

Natural gas was turned into the distribution system of Memphis, Sunday afternoon, December 30.

The gas is being brought to Memphis through the pipe lines of the Memphis Natural Gas Company, from the fields in the Monroe district of Louisiana, a distance of 210 miles.

The Memphis Natural Gas Company was organized to finance and operate the line. That company buys the gas from the producers in the Monroe field, and sells it to the Memphis Power & Light Company at the city gate of Memphis for distribution.

The 210-mile pipe line is 18 inches in diameter and, operated at a 300-lb. pressure, has a capacity of approximately 60 million cubic feet of gas per day for delivery in Memphis. Operated at a 400-lb. pressure, it is estimated that practically 100 million cubic feet of gas can be delivered to the city per day.

Construction of the line required 92 working days. It crosses the Mississippi River a few miles south of Greenville. At this point there are five 10¾-inch pipes, extending from manifolds on either side to which multiple tubes connect. Four of these will carry the flow of gas. The fifth is an emergency line. It is stated that 35,000 tons of steel pipe were used in constructing the line. More than 316,000 gallons of paint were used in surfacing the pipe to withstand rust, dampness, water and corrosion. In the construction also were used 2500 cast iron river clamps, each weighing 1500 lbs. These clamps anchor the pipe line, preventing it from bulging. In addition to the crossing of the Mississippi River, it crosses four smaller streams.

The pipe in overland construction lies in a ditch ranging from five to seven feet in depth. In swampy places the joints are welded and 52,961 dresser couplings were used in connecting the pipe lengths. Each coupling weighs 40 lbs.

Two compressor stations have been built, one at Guthrie, Louisiana, and the other at Benoit, Mississippi. Residences for employes have been built at each station. The station at Guthrie has a total rated capacity of 81 million cubic feet of gas every 24 hours. The station at Benoit has a capacity of 82 million cubic feet.

All along the entire route of the pipe line the operating company maintains its

own telephone lines with a telephone located every 6 miles. The entire route is divided into sections of approximately 13 miles, and inspectors will constantly patrol these different sections.

During the past several months the company made thorough preparations for its distribution. One of the first things done was to revamp the belt line mains. These mains are 12 and 16 inches in diameter and consist of about 14 miles of pipe.

In revamping these mains, all joints were calked with twisted jute and rubber packing, sealed with cement. The original packing of wool, sealed with lead was burnt out with acetylene torches and the new packing introduced. This prepared the mains for a 50-lb pressure which it is contemplated will be needed.

Another phase of the company's preparations consisted in the establishment of a laboratory, consisting of gas appliances of all descriptions, in which employes were trained for adjusting appliances from the use of artificial to natural gas. A feature of this training was the bringing to the laboratory, in large drums, a quantity of natural gas; and by this means the men were given actual experience in the laboratory such as they would meet with in the homes of customers.

When the gas was turned into the city's belt line mains crews were immediately dispatched throughout the area affected, and "bled" the artificial gas from the mains. On the following morning the large force of trained men was sent throughout the area that received the gas, and began making adjustments on appliances of customers, at no charge.

As a measure of facilitating the work also, the city was divided into four districts. The gas serving a particular area was introduced into the first portion of mains and a cut-off valve was installed. By this arrangement one section of the city received Natural Gas, while the remainder continued to use artificial gas. When the conversion of all appliances in this district had been completed, the valve was opened and additional mains for another district were allowed to receive the natural gas up to the point where another cut-off was installed. In this way one district after the other was converted in order.

Prior to beginning the conversion of appliances, the company made a survey of all gas appliances in the city. This survey revealed the make, type and other information which enabled the distributing company to order parts that would be necessary for use in the actual conversion.

From the time that gas was first assured for the city the company began its advertising. Its first advertisement announced the fact that gas was assured, gave the approximate route of the right-of-way, and the capacity of the line. Subsequent advertisements consistently emphasized the convenience and cleanliness of the fuel for domestic, industrial and commercial use.

The largest consumer of natural gas in Memphis will be the electric power plant of the company. Until the introduction of gas, this plant had a daily consumption of 450 tons of coal, or about 160,000 tons per year. Each high pressure boiler has 4 combination gas and oil burners in each side wall, or a total of 8 burners per boiler, capable of burning 25,000 cubic feet of natural gas per hour, and the equivalent quantity of fuel oil, should any accident occur to the gas equipment.

The gas plant of the company will be held as a standby in case of any possible emergency. Its holders, heretofore used for storing manufactured gas will be filled with natural gas for use as occasion may demand.

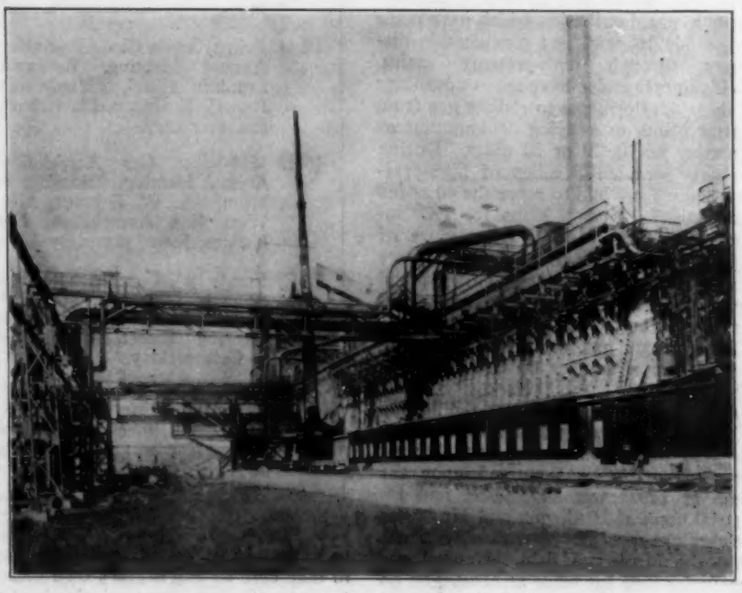
Philadelphia now Getting part of its Gas from Philadelphia Coke Company's New Plant

Coke oven gas purchased from the new plant in the northeastern section of Philadelphia is now being mixed with gas manufactured in the city's plants and distributed to consumers in the city, according to Paul Thompson, President of The Philadelphia Gas Works Company.

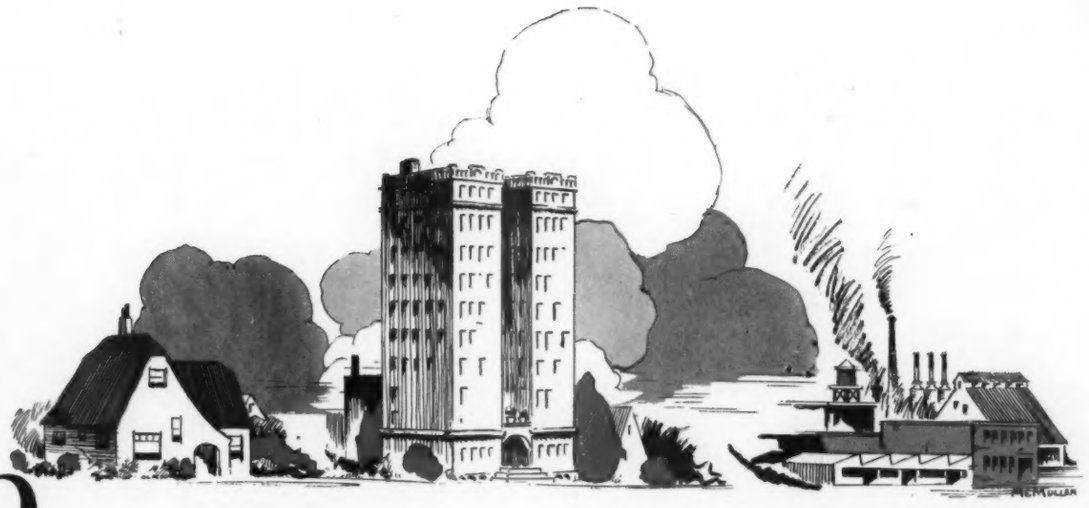
The coke oven gas, which went into the city's mains for the first time on January 30th, is purchased under an ordinance of Council granting the gas company permission to contract for coke oven gas.

The coke oven plant, which is modern in every respect, is located on a sixty-five acre tract on the Delaware River at Richmond and LeFevre Streets, just above the Atlantic City Bridge of the Pennsylvania Railroad. Its erection was started last April by the Koppers Company and its cost was in the neighborhood of $8,000,000. The plant will be operated by the Philadelphia Coke Company. Coke from the plant, it is understood, will be sold by the operating company chiefly for domestic fuel.

"There is a great advantage in this contract to the people of Philadelphia," Mr. Thompson stated, "as it postpones for a number of years large investments which otherwise would have to be made for additions to the city gas plants, to take care of the increased consumption as the city grows. In other words the wisdom of Council in granting permission for the purchase of gas will be seen in years to come, as the City of Philadelphia will not be required to furnish any money for development of its gas plants until the requirements of the city exceed their capacity and the additional amount the coke oven plant can supply to The Philadelphia Gas Works Company. At present twenty to twenty-five percent of the total amount of gas required will be purchased from the coke company. Later, there is a possibility that the capacity of the coke



Philadelphia Coke Company's New Plant



Quality Equipment Grows in Importance

The upward trend in gas utilization and consumption continues. Correlative with this sound growth of an industry is the increasing emphasis which is placed on Quality as an inherent part of essential equipment.

Quality Manufacture Throughout — is a first consideration in the purchase of gas meters.

It is insured by the long experience and the unsurpassed facilities that govern production in the factories of American Meter Company.

Other features of construction are presented in the 1929 edition of our General Catalogue. They are of decisive importance in meeting effectively and economically modern requirements for the measurement of gas.

Add to this a successfully executed policy of Factory Specialization in the needs of individual Gas Companies.

The Net Result has been and will be—

Increasing satisfaction with the performance of American Meter Company Gas Meters. They have proved their ability to excel in every department of Gas Measurement Engineering.

AMERICAN METER CO
MEASUREMENT ENGINEERS
CUBIC FEET

AMERICAN METER COMPANY
JOHN J. GRIFFIN & COMPANY
HELME & MCILHENNY
MARYLAND METER WORKS
D. MCDONALD & COMPANY
METRIC METAL WORKS
NATHANIEL TUFTS METER WORKS
PACIFIC METER WORKS

B Type Meter

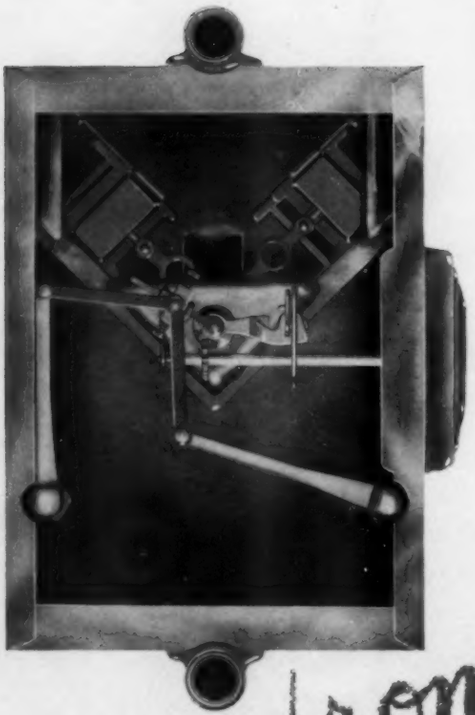


Fig. 1—Valve Table Section with Valve Box Cover removed.

Fig. 1 (Above) shows the construction of the upper, or valve table, section of the meter. The operating parts above the table together with the structural features that characterize sides and galleries, are clearly visible. Attention is called to the following: (1) The fine precision and uniformity of the working parts in relationship to each other. (2) The widening of the projecting flanges on sides and galleries. This affords sturdier casing, facilitates perfect gas-tight sealing, simplifies topping and removes the danger of melting solder around the tube screws. (3) The projecting lip to protect the index. (4) The new valve box cover frame fixed to outlet side, galleries and valve box enclosure. (See detailed description of parts.) This feature, like others, contributes to true economy: Structural strength and durability are increased, while adjustment and repair are made with greater ease and at less cost.

Fig. 2 (Below) illustrates the construction of the diaphragm compartments of the meter. Particular attention is called to the clearance feature, which eliminates friction between the diaphragms and sides of the meter. The simplified and sturdy flag carriage construction with patented bridge plate, may also be noted, as well as the pan-shaped bottom, with continuous edge completely around the sides and corners.

Pages from American Meter Co

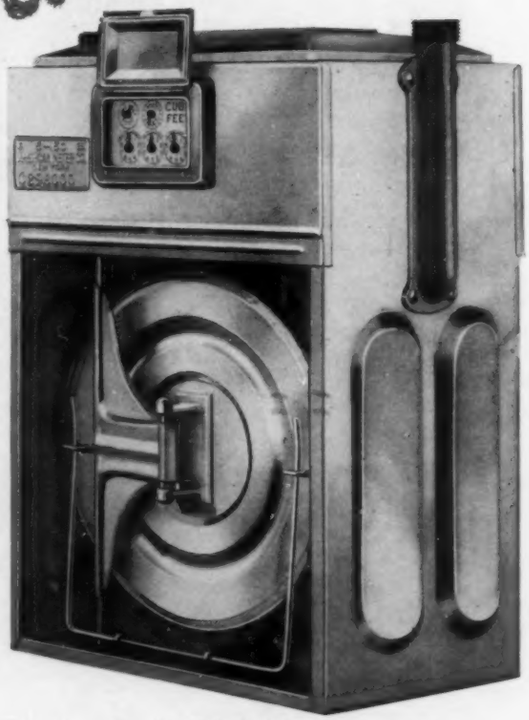


Fig. 2—5-150 B with Front removed.

NOTE: The mechanical method of operation of the two diaphragm, slide valve meter has been fully described in previous American Meter Company literature. Such description may be obtained on request.

Construction Detail

B Type Meter

(The description of parts is presented for ready reference in alphabetical sequence of nomenclature.)

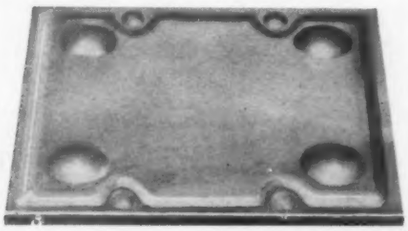
Adjustable Tangent (*See Tangent*)

Axle, Index (*Shaft and Wheel*) (1-)

2—Index Axle Complete

The index axle and wheel made of fine quality brass. All of our axle wheels are spiral cut to fit the pitch or thread of the worm. Two important advantages in this assembly are minimum wear and no noise.

Bottom (3-)



3—Showing Underside of Bottom

American Meter Company bottoms are of the "pan" type stamped with a continuous edge completely around the sides and corners. Objectionable leaks or seepage at the bottom corners, long a source of annoyance to gas companies, is avoided by use of this construction.

Casing

The term includes Bottom, Sides, Front or Back, Galleries and Top Cover. By joint virtue of the practical design and skillful construction of each of these parts and their proper gas-tight assembly—a sound casing is attained.

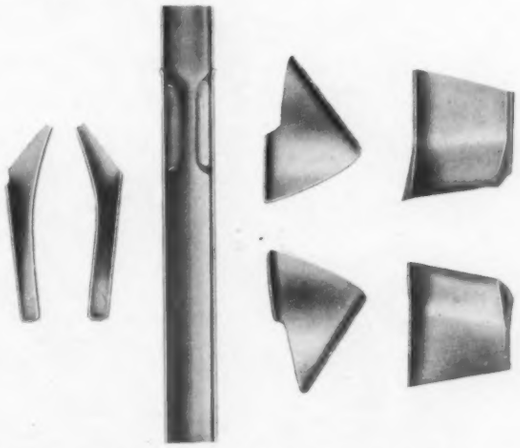
Meter Casing is formed throughout from the finest grade open-hearth, tinned steel sheets. This scientifically correct metal is also used in the construction of channels, partitions, flags, discs, valve table, valve box enclosure, triangle and valve box cover.

In assembly the highest grade virgin metal solder is employed for the thorough sweating of all seams and joints. All work is done under an exact system of factory inspection, by operators long experienced in the art of meter construction and assembly. Please see also the reference under Front or Back on page 18, relating to press work improvements.

Note on Raw Materials for Gas Meter Manufacture.

A manufacturing code of quality—coupled with the large buying power of American Meter Company, make possible the consistent use of the best raw materials that are known to be available for the manufacture of gas meters

Channels (4-)



Showing left to right—Fork Channels, Inlet Channel, Connecting Channels and Diaphragm Channels.

*Parts illustrated are taken from a regular 5-150B meter disassembled for the purpose

Page 8
General Catalogue
Showing arrangement by Sections

GENERAL CONTENTS

Catalogue G-1 Complete

SECTION I.

Gas Meters for Domestic and Industrial Service
Tinned Steel Case—Metric Iron Case

SECTION II.

(a) Diaphragms.
(b) Meter Connections.
(c) Meter Repair Parts.
(d) The Use and Care of Consumers' Meters.

SECTION III.

Large Volume Measurement.
(a) Linderman Orifice Meters.
(b) Westcott Orifice Meters.
(c) Wet Station Meters.

SECTION IV.

APPARATUS

(a) Apparatus for Laboratory and Experimental Purposes.
(b) Apparatus for Service Requirements.

SECTION V.

(a) Recording Demand, Indicating Demand and Empire Limiting Demand Devices.
(b) Demonstration and Glazed Exhibition Meters.

plant may be increased.

"The value of the city's gas works is in no way impaired by the purchase of this gas."

In 1928 a total of 19,901,239,000 cubic feet of gas was sent out from the Philadelphia Gas Works.

U. G. I. Company Declares Regular Quarterly Dividend. Thompson's Resignation Accepted

At a meeting of the Board of Directors of The United Gas Improvement Company held Jan. 23rd, a regular quarterly dividend of two and one-quarter percent (2¼%) or one dollar and twelve one-half cents ($1.12½) per share was declared on the Capital Stock of the Company, payable March 30, 1929, to stockholders of record at the close of business February 28, 1929.

In 1928, the Company paid its regular dividend of eight percent (8%) plus an extra dividend of one percent (1%). The regular dividend rate is now increased from eight percent (8%) or four dollars ($4.00) per share per annum to nine percent (9%) or four dollars and fifty cents ($4.50) per share per annum.

The Board received and accepted the resignation of Arthur W. Thompson as president of the company. The filling of the vacancy in the office of president, as previously announced, will not be considered for the present, but the executive function will continue to be exercised by John E. Zimmermann, chairman of the Executive Committee, under the arrangements which were previously announced.

Southern California Gas Company Declares Dividends

Mr. A. B. Macbeth, President of the Southern California Gas Corporation, announced that at a meeting of that corporation on Friday, January 25th, the regular quarterly dividend of $1.62½ per share on the $6.50 cumulative dividend preferred stock, and an initial dividend of twenty-five cents per share on the common stock, both payable on March 1st to stockholders of record on February 11th, 1929, were declared.

St. Joseph, Mo., Now Using Natural Gas

The first natural gas was turned into the mains of St. Joseph at the gas company works at eight o'clock Monday morning, January 14. It was not long until down town St. Joseph was burning natural gas, and by mid-afternoon every home in the city. The gas was not turned into the South St. Joseph mains until four o'clock that afternoon, but by night every home there was burning a product that has approximately twice as many heat units as are found in manufactured or artificial gas.

"Caterpillar" Tractor Renders Valuable Aid in Gas Fire

The accompanying photo shows how a "Caterpillar" tractor was used in rendering valuable aid at the Bellview Gas fire, at Santa Fe Springs, California recently. The tractor was used in pulling damaged equipment as shown in the accompanying photos.

Advisory Council and Executive Board, A.G.A., Hold Conference in Los Angeles

A conference of the Advisory Council and Executive Board of the American Gas Association was held Feb. 6th and 7th at the Biltmore Hotel in Los Angeles.

Over thirty men from the east and middle west attended, their train being met at San Bernardino on the forenoon of the 5th by F. S. Wade and his associates on the Committee of Arrangements, who took them by auto to Mission Inn, Riverside, for luncheon. Later they were conducted on a sixty mile tour into Los Angeles.

California hospitality was in evidence at all times and the arrangement committees left nothing undone to further the comfort, convenience and pleasure of those attending the conference. A complete report of the meeting will appear in March issue of American Gas Journal.

Grants Petition to Extend Distribution System

The Public Service Commission recently granted a petition by the Iroquois, N. Y. Gas Corporation for right to construct and operate a gas distribution system in Ellicottville, Franklinville and Delevan and towns of Ellicottville, Franklinville, Machias, Yorkshire and Delevan, in Cattaraugus county, and Arcade, village and town, Wyoming county. There is no existing gas service in these towns and villages. The Iroquois Company proposes to make extensions, estimated cost $350,000, and it was stated at the hearing before Commissioner Pooley that there were 1,200 residents of the municipalities who desired service by the company.

Sioux City Company Receipts for Last Half of 1928. Occupies New Building

Gross receipts of the Sioux City, Ia., Gas and Electric Company for the last six months of 1928 were $1,297,244 according to semi-annual report of the utilities company to the city treasurer, which included $369,015 from sale of gas. Under the city franchise the company paid $25,944 upon the total income, a slight increase over the same period of 1927 when the tax figured $24,430.

The company has occupied the new Utilities building, 517 Fifth street, recently remodeled at a cost of $50,000, and all departments of the utilities company, serving the community with gas, electricity and transportation, are now centered in the one building. Formerly division headquarters were divided between the Frances and Commerce buildings. W. J. Bertke is general manager of the Gas and Electric Company.

Pendleton Resigns as President of Pennsylvania Gas Assn.

The Council of the Pennsylvania Gas Association met in Harrisburg on January 24, 1929, at which time the resignation of Mark Pendleton, President of the Association, was accepted with much regret. Mr. Pendleton has been made Vice-President and General Manager of the Iowa Public Service Corp., Sioux City, Iowa.

Grier Hersh, President of the Pennsylvania Gas and Electric Company, York, Pa., was elected to fill Mr. Pendleton's unexpired term to April 10th and 11th, 1929.

Natural Gas Evidently The Good Samaritan

Three big Montana electrical power and light companies,—the Montana Power, Thompson Falls Power, and the Great Falls Power have announced that effective February 1, its minimum charge for electricity for heating, lighting and cooking, in the small residences, will be reduced from Two dollars to One dollar monthly.

Natural Gas Notes In the Rocky Mountain Regions

The Public Service Company of Colorado will spend about a half million dollars for improvements and enlargements of its natural gas service in Colorado, during 1929. It will also install gas service at Littleton, Colorado, eleven miles from Denver, but on the line of the Amarillo-Denver pipe line.

H. F. Benson and Edgar G. Mill, who are believed to represent the Interstate Gas Company, owners of the Amarillo-Denver natural gas pipe line, have asked the city fathers of Las Animas, Colorado, for a franchise to serve the city with natural gas, the rates to be the same as

charged other Colorado cities. The city council will render its decision early this year.

Plant and Mains Included in Sales

Gas plant and mains were included in the sale of the Clear Lake, Iowa, Electric Light and Power company properties to the Central West Public Service company the first of the year. Arthur Johnson, for nine years with the company, the last three of which were as superintendent, has been appointed manager for the Central West in the city.

Rockford Ovens Go Into Operation

The Rockford Ill. Gas-Electric Traction Company January 1 put into operation its new battery of 21 coke ovens, part of the new gas plant, now nearing completion. W. S. McMaster, superintendent, said the new ovens will replace the retort method of making gas and the plant will be completed as rapidly as possible, replacing the old method. The old plant gave 1,000,000 feet of gas to the new one to start it in operation. The new unit, when completed, will have a capacity of 3,500,000 feet of gas and provision has been made for addition of two more batteries which will bring capacity production to 10,000,000 feet. Approximately 60,000 tons of coke will be manufactured annually at the new plant and will be screened into three gradings for use in the Rockford plant.

Prepayment Meter Amendment Approved

The Public Service Commission has approved construction by the Syracuse Lighting Company of a system to distribute gas for light, heat and power in Cicero, Onondaga county, under the terms of a franchise granted by the town board. There is no existing gas service in Cicero. It is planned to extend the service in North Syracuse to territory in Cicero involving about 3,253 feet of gas mains. The rates to be charged for gas will be the same as in North Syracuse.

Des Moines Company to Make Plant Improvements

The Des Moines, Ia., Gas company plans to expend $146,000 on plant improvement and expansion of its distribution system during the early months of this year, C. A. Leland, Jr., vice president and general manager of the gas division has announced. The amount designated for plant additions and replacements will be $39,000, including $11,000 for new condensers and scrubbers; remodeling of the coke shed at a cost of $8,800 and construction of an intake crib in the Des Moines river opposite the crib at a cost of $2,200. A smoke elimination and control device costing $4,950 will be erected.

Main and lateral extensions, the chief outside work, will represent investment of $107,000. South Des Moines will get a new supply main, eight inches diameter and 6,000 feet long. New mains to be laid ahead of paving will cost $3,300 and replacements of old mains will amount to $4,400.

Approve Optional Gas Rate

Announcement has been made by officials of the Northern Indiana Public Service Company that an order approving a new optional domestic gas rate for Fort Wayne has been issued by the Indiana public service commission. The customers will pay a service charge of $1 a month. The rate for the first 2,000 feet will be $1 a thousand, for the next 18,000 cubic feet, 90 cents and for all in excess of 20,000 cubic feet 65 cents. The service is particularly beneficial to customers using self-action gas water heaters.

Another Colorado City Offered Natural Gas

The Public Service Company of Colorado on January 25, asked the city fathers of Boulder Colorado to grant them permission to serve the city with natural gas from the Denver-Amarillo pipe line, stating that the cost to the company would be about $300,000.

The city council are investigating and if it acts on it favorably, a franchise will be drawn up and submitted to the voters. Boulder is thirty miles north of Denver, with about 15,000 population.

New England Gas Association's Divisions Elect Officers

The various divisions of the New England Gas Association elected officers on Friday, January 11th, 1929. At the meeting of the Sales Division, James H. Sumner, for a great many years sales manager of the Cambridge Gas Light Company, was unanimously elected Chairman. John J. McKearin of Lowell was elected Vice-Chairman. Mr. M. B. Webber, the retiring Chairman, was presented with a fountain pen and pencil by the Sales Division. He thanked the members briefly and stated that it had been a real pleasure for him to act as Chairman for the past two years. He introduced as speaker of the evening, Prof. Schell of Massachusets Institute of Technology, who spoke upon the subject "MAKING A LIVING IN A PERIOD OF CHANGE."

Other officers elected for the various divisions for the year 1929 were as follows: Accounting Division—R. D. Washburn, Chairman; Burton Smart, Vice Chairman; Otto Price, Secretary; Manufacturers' Division—T. F. Piser, Chairman, J. D. Taylor, Vice Chairman and J. H. McPherson, Secretary-Treasurer; Industrial Division—L. B. Crossman, Chairman, L. E. Wagner, Secretary-Treasurer; Operating Division—I. T. Haddock, Chairman, A. S. Hall, Vice Chairman and H. G. Taylor, Secretary-Treasurer.

Personals

John R. Welch was re-elected president of the Citizens Gas Company, Indianapolis, Ind. to serve during this year at a recent meeting of directors of the company. All other officers were re-elected as follows: Clarence L. Kirk, vice president and general manager; Gustave A. Efroymson, treasurer; Frederic G. Rastenburg, secretary; V. V. Smith, assistant secretary, and L. M. Edwards, assistant secretary.

Mr. Efroymson, H. H. Hornbrook and G. H. Hooker were appointed members of the executive committee. Directors discussed the proposed sale of the gas company to the city, but no definite action was taken, according to Mr. Hornbrook, who is acting as one of the attorneys in the case.

Clyde A. Farnsworth, who joined the Public Service Company of Colorado, when he graduated from the Kansas University, about seven years since, serving as a member of the sales department of the Public Service Company at Denver, has been transferred to Bristol Tennessee as manager of the sales department of the Bristol Gas & Electric Company.

Clare N. Stannard, vice president and general manager of the Public Service Company of Colorado, was recently elected president of the President's Round Table of Denver, for the year of 1929. To be eligible, one must have been president of some civic club.

W. D. Shannahan, manager of the Kentland (Ind.) district of the Interstate Public Service Company for the last three years, has resigned to accept a similar position at South Boston, Va. The Kentland district will be in charge of Raymond Mashino. Kenneth Roland will move from Kentland to Monon, Ind., where he will be local manager of the company.

Earl C. Murley, manager of the Columbus, Ind., district, has been elected first vice president of the Chamber of Commerce there. He has for years taken an active part in civic affairs there.

Joseph W. Hutchinson, deputy Indiana attorney general, and Owen S. Boling, secretary of the state board of tax commissioners, will appear in the circuit court at Laporte, Ind., Jan. 24 to argue for the tax board on appeal of the Laporte Gas Company against taxes fixed by the state board. The company charges the amount fixed by the state board is excessive as compared with similar levies in other cases.

C. R. Lang was elected commander at the recent election of officers for Lieut.

(*Continued on page 78*)

REDUCED PRICES

On Welsbach HOTZONE

SELF ACTION GAS WATER HEATER

THE WELSBACH POLICY has always included a consistent effort to increase the gas company market for Water Heaters. This new price revision is another long step forward . . . All Welsbach Water Heaters may be had with or without safety gas shut-off and temperature-pressure relief valve.

Confidential information concerning the newest addition to the Welsbach Water Heater family may be had in advance by writing Welsbach Company. Do not complete your new season's contracts until you have read these interesting details.

WELSBACH COMPANY
GLOUCESTER CITY, N. J.
Branches in Principal Cities

Member
American Gas Association

Personals

(Continued from page 76)

Marion L. Willis post No. 101, Veterans of Foreign Wars.

Commander-elect Lang has for several years been superintendent of the municipal gas plant at Colorado Springs, Col.

A. B. Morton was recently elected president of the Rome Chamber of Commerce at a special organization meeting of the directors. Mr. Morton was vice president in 1928. As president he succeeds E. Huntington Ethridge.

Mr. Morton has been manager of the Rome, (N. Y.) Gas, Electric Light and Power Company since 1912.

John I. Whitehead, a member of the Accounting Department of Fall River Gas Works Co., was presented on January 16th with the President's Medal of the National Safety Council for saving the life of a young woman who was taken unconscious from the water at Horseneck Beach, August 7th, 1927.

J. J. Whitehead

Mr. Whitehead was the only one in a crowd of fifty or more present who knew how to administer artificial respiration. Through his prompt application of the Schaeffer Prone Pressure Method of Resuscitation, the victim, Mrs. Herbert Pierce of Taunton, Mass., was revived after about fifteen minutes work.

The medal was presented to Mr. Whitehead by Mr. Marcy L. Sperry, Division Manager of Stone & Webster, Inc., at a meeting held in Mr. Whitehead's honor which was attended by members of the company, officials of Stone & Webster, Inc., and representatives from several other public utilities and the Massachusetts Safety Council.

J. Henry Lakamp retired on January 1, 1929, from the position of Manager of all gas properties of The Union Gas and Electric company, of Cincinnati, Ohio, and subsidiary organizations. E. A. Munyan, formerly assistant to Lakamp, has succeeded to the managerial post. The reorganization will not sever Lakamp's connections with the organization entirely, however, as he has been prevailed upon to continue in the capacity of Consulting Advisor in the Gas Department.

J. H. Lakamp

Lakamp's association with the Cincinnati company covers a period of more than 45 years, he having taken up the duties of messenger boy for the Gas Company on March 13, 1883, and going through the ranks to become one of the best known gas men in the country.

In sharp contrast to the many years of service, which has been Lakamp's experience, Munyan, the newly appointed Manager, has been connected with the company only a brief two years, and it is the longest period he has ever served for one organization. The explanation is that since entering the public utilities field, Munyan has been more than usually active, and has risen to his present post by veritable leaps and bounds.

Raised in Philadelphia, Munyan was educated in the public and high schools of that city, and received his technical education at the University of Pennsylvania, from which institution he graduated in 1916, as an electrical engineer. Like many another gas man of the present, Munyan, though trained as an electrical man, was to find his greatest opportunity in the sister field of gas.

Munyan first entered the gas business as an office boy in the Philadelphia District of The United Gas Improvements Company, and worked for them during his summers at college.

In December 1926 he was employed by the Union Gas and Electric Company, where he is now located.

In commemoration of Lakamp's withdrawal from active connection with the gas company, he was guest of honor, along with a fellow worker, Frank Espach, who had completed 40 years of active service with the company, at a dinner, given January 14, in the banquet hall of the Chamber of Commerce, at Cincinnati, and at which Munyan acted as toastmaster. He was presented with a handsome cigarette lighter, as a momento of the occasion, and a token of the esteem in which he is held by his associates of the gas company.

E. A. Munyan

William Insull, manager at Lafayette, Ind., for the Northern Indiana Public Service Company, operating electric and gas utilities in that section, has resigned to accept a position with the National Electric Power Company, with offices in New York City. He has been manager at Lafayette for the past four years.

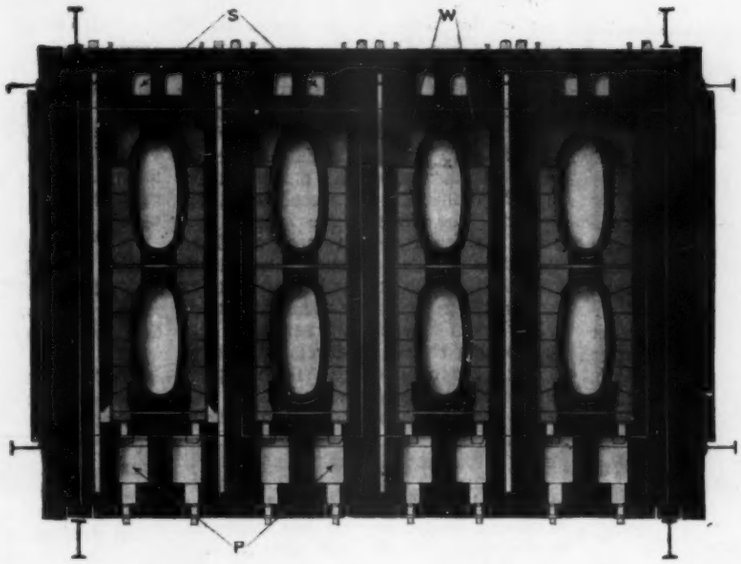
The vacancy in the company will be filled through appointment by S. E. Mulholland of Fort Wayne, vice president of the Northern Indiana Public Service Company and the appointment is expected shortly for Mr. Insull expects to assume his new duties immediately.

Eltinge Creech Cooper, during the thirty months he has been with the Western Distributing Company at El Dorado, Kansas, has sold $47,986.24 worth of gas appliances or an average of $1,599.54 per month, a very consistent record on a territory averaging about 750 gas meters.

Mr. Cooper set his cap for the New Business medal offered by the El Dorado New Business Department for 1928, and captured the prize with sales of $17,106.81. He was star man 7 out of 12 months of the year.

Scott Turner, Director of the Bureau of Mines, has been appointed as representative of the Department of Commerce on the four-man Advisory Committee of the Federal Oil Conservation Board. The other members of the Committee are Maj. Gen. Edgar Jadwin, War Department, Rear Admiral Harry H. Rousseau, Navy Department, and George Otis Smith, Geological Survey. The Board is composed

GLOVER-WEST
Vertical Retorts



The Retort Setting is characterized by several other points peculiar to the Glover-West System. The admission of the secondary air to the combustion chambers by way of passages in the walls not only makes use of radiated (otherwise lost) heat but ensures the stability of the walls under maximum temperature conditions.

P = Producer gas uptake.
S = Secondary air uptake adjacent to
W = Internal waste gas uptake.

All retorts are equally heated on both sides. Expansion is fully allowed for. Temperatures are under complete control.

WEST GAS IMPROVEMENT CO.

Builders of Coal Gas Plants

441 Lexington Ave. New York

of the Secretaries of War, Navy, Interior, and Commerce.

Mr. Fred Nadra, whose record of service is longer than that of any other in the employ of the Detroit City Gas Company, has recently completed fifty years of employment, largely in the Shops Department. In honor of the event, Mr. Nadra was the guest of honor at the first meeting of the Citigas Executives' Club for 1929, upon which occasion felicitations were extended to him, culminating in the presentation of a check by Mr. Bennett in recognition of long and faithful service.

Obituary

F. R. Weller Dies

Francis R. Weller, 49 years old, guiding spirit behind many important power projects in the South, died on January 13th at his residence, 1500 Farragut street, Washington, D. C.

Mr. Weller was recognized as a leader in civil and electrical engineering circles in Washington and through the South. He had organized a number of utility companies and at the time of his death was president of the Allied Utilities Co., North Alabama Utilities Co., Mississippi Gas Co. and the Consumers' Gas Co.

Charles Gilbert Francklyn

Charles Gilbert Francklyn, for many years prominent in steamship circles and equally prominent in the gas industry in New York City, died on Jan. 10th morning at his home, No. 160 East 95th Street, after a few days' illness. Mr. Francklyn was born April 18, 1844, near Newcastle, England. Mr. Francklyn arrived in Halifax when he was sixteen years old and remained there until 1865, when he came to New York where later he became the Agent of the Cunard Line. In 1878 Mr. Francklyn organized the Municipal Gas Light Company in New York and became that company's President. It was while Mr. Francklyn was President of the gas company that he became interested in a water-gas process, invented by Tessier de Motay, a gas-making process that has become universal in use. The late William H. Bradley, Chief Engineer of the Consolidated Gas Company of New York, at that time was Chief Engineer for the Rolland Iron Works, and Mr. Francklyn selected him as Chief Engineer of the Municipal Gas Light Company to develop the Motay water-gas process. Chief Bradley obtained through William Rockefeller the privilege of using a refuse that the Standard Oil Company was disposing of at sea. Experiments showed that this refuse could be used for the manufacture of water-gas and a contract was made at one cent a gallon for a period of two years. The refuse at that time turned out to be naphtha and the gasoline of today. The development of the water-gas process compelled the Metropolitan and Manhattan Gas Light Companies, which were making coal gas exclusively, to change their processes, and then followed in 1884 the organization of the Consolidated Gas Company of New York through a merger of the old gas light companies. Mr. Francklyn was a member of the first board of trustees of the Consolidated, which he helped to organize with the late Harrison E. Gawtry. It was at the time of the organization of the Consolidated that Mr. Francklyn invited several prominent men, Moses Taylor and others who were interested in the new Consolidated Gas Company, to have dinner with him. Mr. Francklyn invited his guests to visit his kitchen and there showed them a new range and told them that the dinner had been cooked entirely by gas. The diners were greatly surprised to learn that a meal could be cooked by gas, and although Mr. Francklyn told them he had had the gas range constructed in Baltimore at an expense of $275, Moses Taylor said seriously that gas cooking should be developed, and to increase the sales of gas, the company ought to give away gas ranges.

Mr. Francklyn in later years became President of the Central Union Gas Company, a position he held for several years, while at the same time he was interested in cattle raising in the West and in mining properties. He practically retired from active business several years ago.

He is survived by his wife, Susan S. Hoyt, a son, Gilbert, who is Fuel Agent of the Consolidated Gas Company of New York, and a daughter, Miss Doris Francklyn.

Trade News and Construction

United Engineers & Constructors Complete Important Distribution System in New England

Many small uneconomical gas plants throughout the United States are rapidly being abandoned in favor of high pressure transmission lines and large economical manufacturing plants. Numerous large high pressure mains have been laid in the West, but probably the largest of such systems in the East recently was made fully available when a 20-inch main crossing under the Quinnipiac River, Connecticut, was completed.

The main, of steel excepting the underriver section, which is cast iron, is of 16", 12", 8" and 6" pipe. It has a total length of approximately sixty-five miles and connects the distribution systems of Hartford and New Haven and the towns and cities enroute with the Connecticut Coke Company's plant at New Haven. The line was built by United Engineers & Constructors, Inc., Philadelphia, a subsidiary of The United Gas Improvement Company.

Started in the summer of 1927, the project was extended in stages and now supplies a large part of the gas requirements of the Connecticut Light and Power Company in Bristol, Plainville, Cromwell, Middletown and Meriden, the New Haven Gas Light Company in New Haven and the Hartford Gas Light Company in Hartford.

From New Haven to Yalesville, a distance of approximately 18 miles, the main is 16" with Dresser couplings. From Yalesville to Hartford, 21 miles, it is 12" with welded joints. On this section, the main through the city of Meriden was equipped with Dresser couplings over the welds.

A 6" welded spur line, 10 miles in length, was taken from the main line to supply the towns of Cromwell and Middletown. In Cromwell a complete distribution system, consisting of 4 miles of welded 4" and 2" pipe, was installed.

Another spur line—11 miles of 8" welded—was extended from the main line to supply Plainville and Bristol.

Complete metering and governor stations were built at Meriden, Plainville and Cromwell and the entire line was equipped with an extensive system of valves.

Gas generating plants at Bristol, Meriden and Middletown have been discontinued and the plants at Hartford and New Haven are being operated mainly to supply peak loads.

General Refractories Co. Opens San Francisco Office

General Refractories Company, has recently opened a San Francisco office which is located at 742 Russ Building. This office is in charge of Mr. W. E. Dornbach.

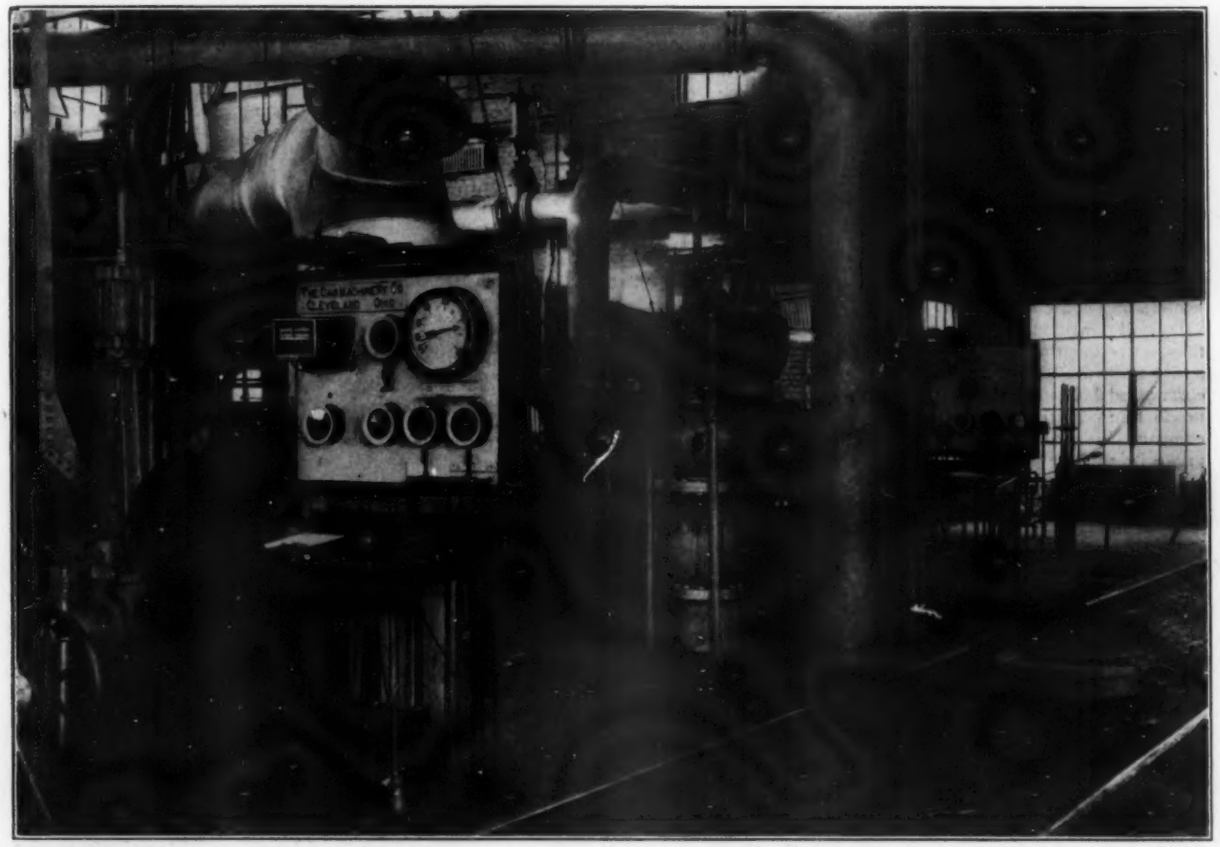
Mr. Dornbach has been associated with the Philadelphia office of the General Refractories Company for several years. Prior to that he was manager of their Baltimore works which specializes in the manufacturing of magnesite and chrome refractories.

General Refractories Company, has changed the address of their Detroit Office to 6-230 General Motors Bldg., Detroit, Michigan. This office will continue to be in charge of Mr. J. L. Graham.

Several Companies Merge into Time-O-Stat Controls Company

A consolidation of the following firms under the name of Time-O-Stat Controls Company,—has been announced—Leach-

(*Continued on page 82*)



An Accurate Check on Steam is Essential to Efficient Water Gas Production

"We use our Brown Electric Flow Meter," says Mr. Fred C. Hill, Gas Engineer with the Hudson Valley Coke & Products Corporation, "in regulating the flow of steam to insure proper reactions in the generator."

Mr. Hill likes his big Brown flow indicator, because, as he says, "Its large dial is visible for some distance." Ease of reading at a distance is an important instrument advantage, especially in industrial plants. But there are other Brown Electric Flow Meter advantages of even greater importance. Its remarkable inductance bridge principle, for instance. Get Catalog 20 and learn all about it.

THE BROWN INSTRUMENT COMPANY
4473 Wayne Avenue, Phila., Pa.
Branches in 20 principal cities

Brown Electric Flow Meter

on the Inductance Bridge Principle

wood Company, Janesville, Wisconsin, Time-O-Stat Corporation, Milwaukee, Wisconsin, Absolute Con-Tac-Tor Corporation, Elkhart, Indiana, Cramblet Engineering Corporation, Milwaukee, Wisconsin. The new company will make a complete line of automatic controls for both domestic and industrial types of refrigeration and for heating with either oil, gas or coal. Also a very diversified line of controls and thermostats for gas, oil, electricity, etc., for time, pressure, humidity and temperature, sign flashers, heaters and other specialties.

It will own many patents including those covering the manufacture of (light and heavy duty) mercury switches and corrugated bellows. Manufacturing these products in its own plant will put the company in a position to not only improve its present products, but also carry on the development of new devices embodying such units.

General sales and service offices have been opened in the Peoples Gas Building, Chicago, and eastern offices will be opened in New York City. The present sales and service organizations of the four companies will be consolidated and considerably increased.

Building contracts will be let immediately to greatly enlarge the plant and offices at Elkhart, Indiana. A separate building will also be erected for laboratory, experimental and development work. As soon as these buildings have been completed, the businesses of the three Wisconsin companies will be moved to Elkhart.

The officers of the company will be: President and Treasurer, Julius K. Luthe; Vice Presidents, A. I. Wallace, Paul K. Cramblet, E. J. Leach and Roy W. Johnson.

Queer Joins Pittsburgh Coal Company

Thomas H. Queer has recently joined the Sales Department staff of the Pittsburgh Coal Company, where his long and intimate knowledge of the production end of the coal business will be of decided advantage in the preparation and marketing of the product of this large and progressive coal company. Mr. Queer is particularly well fitted for his duties with the Pittsburgh Coal Company, having spent many years in the producing fields of both Pennsylvania and West Virginia, and he has had occasion to make surveys as to sources of supply of various quality coals in most of the eastern coal fields of the United States. He is a graduate in Coal Mining of the Carnegie Institute of Technology.

For the past five years Mr. Queer has been assistant to the Coal Purchasing Agent of the H. C. Frick Coke Company (U. S. Steel Corporation) in connection with the purchasing and selection of coals to be used under various conditions for various purposes at the different plants of the U. S. Steel Corporation. Immediately prior to going with the Frick Company he was connected with the Mining Extension Department of the University of West Virginia. Before that he was with the Cleveland-Cliffs Iron Company, in charge of one of their Logan County mines.

Gas Machinery Company to Install Water Gas Set in Connersville

The Peoples Service Company of Connersville, Indiana, are extending their gas plant in order to take care of increased demand for gas service, and they have placed an order for one six foot water gas set with cone top shells, steam turboblower, charging floor and an electrically operated fuel charging hoist with fuel buggy.

The water gas set will be provided with the Manufacturer's standard cooler gas connection, and additional to the set is included a tar washer and a cooling scrubber, the latter of which will be provided with the Gas Machinery Company's standard cooling coil.

Construction work in the field will start in the near future, as the Gas Company is in urgent need of this increased capacity.

The Atlantic Construction and Engineering Company of Philadelphia, Pennsylvania have ordered equipment for a new gas plant to be erected at Reidsville, North Carolina.

The apparatus to be furnished under this contract consists of Gas Machinery Company's standard Five Foot Cone Top Water Gas Set with Cooler Gas connections and valves, oil feed system, charging apparatus and floor.

Additional to the water gas set will be provided one water tube gas condenser which will be located on the outlet of the relief holder, one bubbling type tar washer, and two welded steel purifiers, each 10 ft. 0 in. wide, 12 ft. 0 in. long and 12 ft. 0 in. deep.

The purifiers are provided with valve manifold for reversing the flow of gas and are also built for Duplex operation. Additional to a generous size self-sealing top cover, each purifier is provided with a self-sealing side door, the opening being 3 ft. 8 in. wide and 11 ft. 0 in. high to permit handling the oxide in and out of the boxes.

A rotary type station meter, gas connections, and a separating tank for treating tar and liquor completes the equipment to be furnished under this contract.

The community to be served has been without gas service heretofore.

The Colonial Utilities Corporation of Rochester, New Hampshire, through Burdick and Company, 30 Broad Street, New York, have placed an order for a cooling scrubber and the manufacturer's standard type of cooling coils to be installed in the gas plant at Rochester.

The contracting company are at present installing a Five Foot Cone Top Water Gas Set at Rochester, and the cooling scrubber is required to take care of the increased capacity of this plant as a result of the new set.

The entire new construction work is under the general supervision of Mr. George I. Keal, Chief Engineer, of Burdick and Company.

New Prest-O-Lite Plant in Memphis

A new Prest-O-Lite Acetylene Plant, at 1241 North McLean Boulevard, Memphis, Tenn., recently commenced operations. This plant, which is the thirty-sixth of the Pest-O-Lite chain, will supply nearby industries with dissolved acetylene for oxy-acetylene welding and cutting.

J. Brown is superintendent of the Memphis plant and C. A. Anderson, whose headquarters are at Birmingham, is district superintendent.

Shea Joins Servel

Mr. Frank P. Shea formerly of the Copeland organization, has joined the Servel Sales, Inc., as District Manager in the Cleveland district with headquarters at Cleveland, Ohio.

McDowell Appointed Director of Research of Harbison-Walker Refractories Co.

J. Spotts McDowell has been appointed Director of Research of the Harbison-Walker Refractories Company, Pittsburgh, Pa.

The scope of the company's research work will be broadened at the central laboratory in Pittsburgh, while in general, control work to insure uniformity of product, will to a large extent be handled in the smaller laboratories at the individual plants.

Mr. McDowell, who has been connected with the Harbison-Walker Refractories Company for some twenty years, is well known to the refractories and allied industries through his contribution to technical literature and his activities in the American Ceramic Society the American Society For Testing Materials, the American Refractories Institute and other societies of which he is a member. He is a graduate of the Massachusetts Institute of Technology in Mining Engineering.

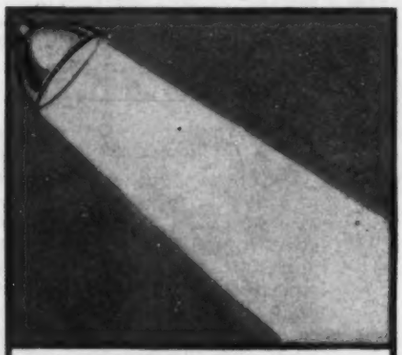
Brown Instrument Company Exhibit at Chicago Power Show

The following flush type power plant instruments will be mounted on black metal panels and exhibited at the Chicago Power Show, Feb. 12-16.

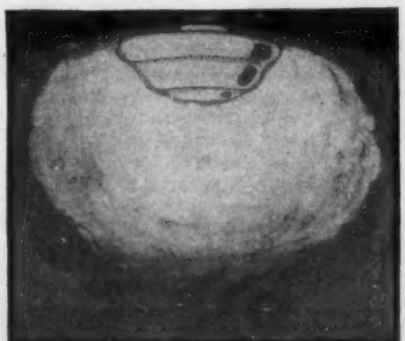
Indicating and Recording Pyrometers, Indicating and Recording Flow Meters,

(*Continued on page 84*)

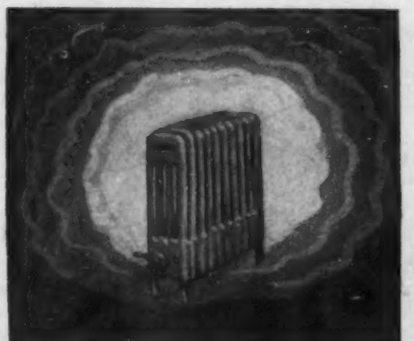
No "Spotlight" or Scorched Air Heating with Clow Gasteam Radiators



A spotlight. The way some heating fixtures operate. Fierce heat on spot. Cold areas elsewhere.



A diffused office light. Illustrates the way Clow Gasteam Radiators radiate heat. Rays are thrown to every part. All areas within a reasonable distance are equally heated.



The way Clow Gasteam Radiators give off heat. They don't hug heat to one small scorched area or throw it on one spot.

A SPOTLIGHT is all right for certain purposes. But you can't make a room comfortable with "spotlight" heating.

Another point: heating a small volume of air to very high temperatures—scorched air heating—results not only in very faulty heat distribution, but the quality of air in which human beings must live is greatly impaired.

There's no spotlight, or scorched air heating with Clow Gasteam. Clow Gasteam means *steam* heat, radiated in every direction—downward, upward and sideways. Clow Gasteam heats a very large volume of air to medium, healthful temperatures.

Heating with Gasteam Radiators doesn't result in frigid zones and torrid zones, both in the same room—at the same time. Floors as well as ceilings are warm—the farthest corner is as comfortably warm as next to the radiator—when rooms are heated with healthful, comfortable Clow Gasteam Radiators.

JAMES B. CLOW & SONS
201-299 North Talman Avenue, Chicago

CLOW GASTEAM

A. G. A. and Underwriters' Laboratories Approved

STOCKED IN EVERY SECTION OF THE COUNTRY

Brown Instrument Company

(*Continued from page 82*)

Recording Thermometers and Pressure Gauges, Duplex Temperature and Pressure Recorders, Strip Chart Recording Thermometers, Indicating Resistance Thermometer so sensitive as to operate when the bulb is clasped in the hand, Strip Chart Recording Resistance Thermometer, Brown Electric Carbon Dioxide Meters in operation, Intermediate and Low Range Manometers, Forged Steel Manometers in various stages of construction, Portable Pyrometers and Potentiometers, Draft Gauges, Thermocouples, Protecting Tubes, Automatic Control Valves and Distant Reading Pressure Transmitter, will be included in the exhibit.

Special interest will be found in the large four foot flow meter, showing the mechanism and operation of the inductance bridge principle which will be demonstrated. The wide line of service covered by this exhibit affords the visitor to the Brown Instrument Company's Booth an excellent opportunity to study the use of meters in the modern power plant.

R. W. McClenahan Appointed Assistant Manager—Helme & McIlhenny

American Meter Company has announced the appointment of R. W. McClenahan to the position of Assistant Manager of the Helme & McIlhenny factory, Philadelphia.

Mr. McClenahan was graduated from Princeton University in 1924, with the degree of Bachelor of Science. In 1926, after two years of study in the Mechanical Engineering Department of the Towne Scientific School, University of Pennsylvania, Mr. McClenahan took a position with American Meter Company to specialize in Measurement Engineering.

American Meter Company's General Catalogue

The American Meter Company has recently issued General Catalogue G-1, a well arranged book of some two hundred pages with numerous illustrations and data of interest to all gas men.

In addition to comprehensive descriptions of their meters, proving equipment, calorimeters and miscellaneous laboratory apparatus the catalogue devotes considerable space to a complete review of the subject of the use and care of gas meters. Another section deals with demand meters and their construction, use and operation. Numerous charts, tables and the like help to make this publication worthy of space in the office of a great number of gas operating men and others.

Heat Transfer Products, Inc., Now Controlled by American Locomotive Company

Announcement has just been made by Heat Transfer Products, Inc., designers and builders of an extensive line of heat transfer apparatus, that it has become affiliated with the American Locomotive Company.

All manufacturing will be done in the plants of the American Locomotive Company, located in several parts of the United States and in Canada.

George T. Jacocks remains as manager of Heat Transfer Products, Inc. The company name as well as most of the key men will be retained.

Heat Transfer Products, Inc., are now producing equipment for the gas, petroleum, textile, power plant, heating and ventilating, refrigeration, laundry, paper mills, chemical plants and other industries requiring any type of heat transfer apparatus.

The offices of the company are located at 30 Church Street, New York, N. Y., where inquiries and requests for engineering data should be addressed.

General Refractories Company Opens New Sales Office in Boston

The General Refractories Company of Philadelphia, Pa., announces the opening of a new district sales office, to be located in the Marshall Building, 40 Central Street, Boston, Mass. The office will be in charge of Nelson W. Bowman, formerly of their New York office. The company also announces the change of the address of their Detroit office to 6-230 General Motors Building, Detroit, Michigan. The office will continue to be in charge of Mr. J. L. Graham.

An Important Announcement to the Users of Elkhorn Coal

Effective April 1st, 1929 Consolidation Coal Company will discontinue the use of the name "Consolidation Elkhorn" as a trade designation of their standard Elkhorn coal.

After that date genuine Consolidation Elkhorn coal mined and prepared according to Consolidation standards will be designated, offered and sold exclusively by them under the trade name of "Cavalier" coal.

"Cavalier" coal will be genuine Consolidation Elkhorn—the high quality, rigid inspection and careful preparation will be continued. The registered trade mark will prevent any possible confusion with other Elkhorn coals.

"Cavalier" coal will be mined, prepared and serviced exclusively by this company—it will be the only coal from the Elkhorn field in which they have any interest.

Servel Appoints Two Assistant Sales Managers

Mr. George L. Roach has been made Assistant Sales Manager of Electrolux Refrigeration and Mr. Gordon Cameron has been made Assistant Sales Manager of Servel Compression line. Mr. Roach has been General Service Manager since May 1928 and has been with Servel for several years. At first as a special sales representative out of Chicago office and later as a special sales and service representative of the Southwestern district. Later he became Assistant Division Manager of the southeastern division, then District Sales Manager and May 1928, was appointed General Service Manager.

Mr. Cameron comes to Servel after a long service with the West Philadelphia Buick Company of Philadelphia as General Manager where he was in charge of merchandising and service.

Manufactured Fuel Output Nearly A Million Tons in 1927

The Department of Commerce announces that, according to data collected at the biennial census of manufactures taken in 1928, the establishments engaged primarily in the production of manufactured fuel in 1927 reported an output of 917,262 tons, valued at $7,203,410, an increase of 19.7 per cent in value as compared with $6,019,310 for 1925, the last preceding census year.

In addition, manufactured fuel is produced to some extent as a secondary product by establishments engaged primarily in other lines of manufacture. The quantity of such fuel thus produced outside the industry proper in 1927 was 64,867 tons, valued at $889,174.

The establishments classified in this industry are those engaged primarily in the manufacture of fuel, generally in the form of briquettes, from anthracite culm, bituminous slack, charcoal, etc., mixed with asphaltic pitch, coal-tar pitch, or some other suitable material as a binder.

Of the 20 establishments reporting for 1927, 3 were located in Pennsylvania, 2 each in California, New Jersey, Virginia, Washington, West Virginia, and Wisconsin, and 1 each in Indiana, Maryland, Massachusets, Missouri, and New York. In 1925 the industry was represented by 14 establishments, the increase to 20 in 1927 being the net result of a gain of 8 and a loss of 2. The 8 establishments gained reported for the first time at the present census. The 2 establishments lost reported, for 1927, commodities other than manufactured fuel as their principal products and were therefore transferred to the appropriate industries.

Recent Higher Court Decisions

(*Continued from page 68*)

lidity of the franchise and it was contended that the ordinance granting the franchise was void because it had not been advertised in compliance with the general law requiring such ordinances to be advertised for twenty-one consecutive days.

However, the Court held the franchise valid because the statute regulating franchises had been complied with, saying:

"It is urged, however, that the ordinance is invalid because it was not published for three consecutive weeks, as provided by R. S. 2801. But that section is *not* applicable."

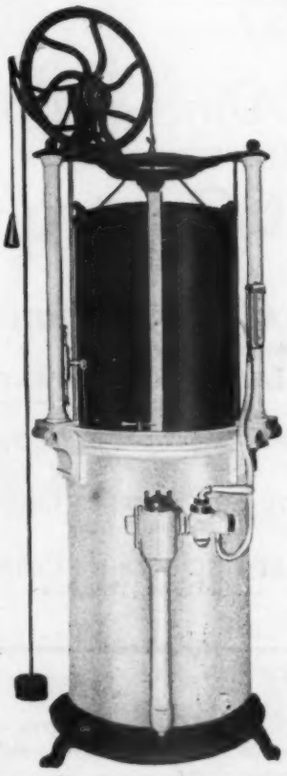
SUPERIOR

Gas Meters

Provers

Service Cleaners

Diaphragms



SUPERIOR METER CO.
167-41st Street
Brooklyn, N. Y.

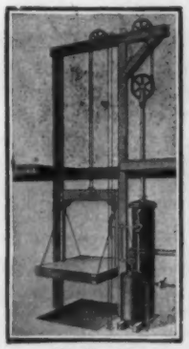
Sing Comic Songs
If You're Blessed With Steam—
You Can Have Perfect Elevators

"Ridgway you have the finest thing in Elevators the world has ever seen for the man who has steam," said the greatest elevator expert of the land to "Old Hook 'er to the Biler."

Here is what the man with Steam gets in the Ridgway Elevator:

1.—**Does away with counterweight ropes, &c.**
The water does the counter-balancing needed.
2.—**Absolutely Fool Proof.**
No overloading or going into the overhead.
3.—**Goes at any desired speed by valve opening.**
4.—**Stops level at floors.**
Because controlled by valve and not by brake.
5.—**Only 3 moving parts.**
Steam Valve, Water Valve and Piston.
6.—**Valves don't make as many motions in a year as valves on engine make in an hour.**
Valves last forever.
7.—**Piston packing lasts five to ten years.**
8.—**There are no repairs.**
9.—**Costs virtually nothing to run.**

Direct Acting



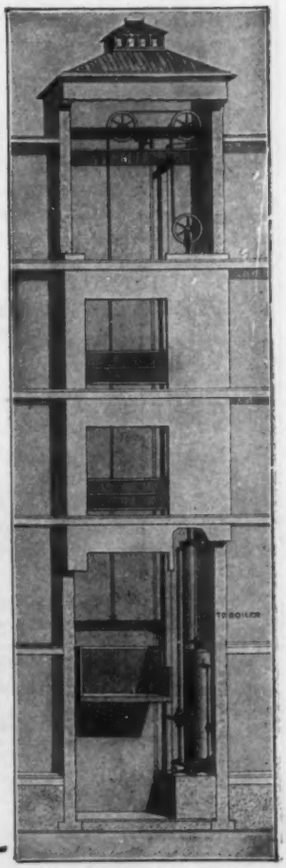
Double Geared

This is Why Every Happy Steam Hydraulicker Sings

"HOOK 'ER TO THE BILER"

Craig Ridgway & Son Co. Coatesville Pa.

Over 3,000 in daily use



Announcing

Time-O-Stat Controls Company

A Consolidation of

LEACHWOOD COMPANY
Janesville, Wisconsin

TIME-O-STAT CORPORATION
Milwaukee, Wisconsin

ABSOLUTE CON-TAC-TOR CORPORATION
Elkhart, Indiana

CRAMBLET ENGINEERING CORPORATION
Milwaukee, Wisconsin

THE MERGING OF THESE FOUR COMPANIES will place at the services of its customers, and the industries which it serves, one consolidated company with ample resources and complete facilities for the development and manufacture of a very complete line of automatic controls.

IT WILL BE THE AIM OF THIS NEW COMPANY to maintain the reputation of making the finest and most dependable products of its kind, to hold the good will of its customers through the fairness of its policies and the service it renders, to sell its products at the lowest price consistent with the quality of the product and the service it renders.

THE COMPANY WILL HAVE A COMPLETE LINE OF AUTOMATIC CONTROLS for both domestic and industrial types of refrigeration and for heating with either oil, gas or coal. Also a very diversified line of controls and thermostats for gas, oil, electricity, etc., for time, pressure, humidity and temperature, sign flashers, heaters and other specialties.

IT WILL OWN MANY PATENTS including those covering the manufacture of (light and heavy duty) mercury switches and corrugated bellows. Manufacturing these products in its own plant will put the company in a very favorable position to not only improve its present products, but also carry on the development of new devices embodying such units.

TO ENABLE IT TO BETTER SERVE YOU general sales and service offices have been opened in the Peoples Gas Building, Chicago, and eastern offices will be opened in New York City. The present sales and service organizations of the four companies will be consolidated and considerably increased.

BUILDING CONTRACTS WILL BE LET IMMEDIATELY to greatly enlarge the plant and offices at Elkhart, Indiana. A separate building will also be erected for laboratory, experimental and development work. As soon as these buildings have been completed, the businesses of the three Wisconsin companies will be moved to Elkhart.

A LARGE STAFF OF ENGINEERS AND TECHNICIANS, each a specialist, will have ample facilities in the new laboratory for carrying on their work of constantly endeavoring to improve its products, develop new controls, and do experimental work for our customers.

THE OFFICERS OF THE COMPANY WILL BE: President and Treasurer, Julius K. Luthe; Vice Presidents, A. I. Wallace, Paul K. Cramblet, E. J. Leach and Roy W. Johnson.

NOTE: Correspondence should be directed to each of the four companies, just as heretofore, until notice has been given that all the general offices have been consolidated and moved to Elkhart, Indiana.

Sell.. Hot Water Service

...Low operating cost, dependable service, long life and absolute safety are of far greater importance than low first cost!

... not just a water heater!

WHEN A CUSTOMER of yours buys a water heater, he is not buying a mere piece of equipment with which to heat water. He is buying the comfort, convenience, health and happiness that hot water service provides.

And you'll find that he is far more interested in the kind of service he will get, and its monthly cost, than in the cost of the heater itself.

So it's up to you to see that he gets honest value, that he will get unfailing service, with absolute safety, at the *lowest possible monthly cost.* It's up to you to see that he gets the service, efficiency, durability and safety of the Humphrey, for, although it costs a little more to buy, it is vastly cheaper to own.

Call in a Humphrey Merchandise Man. Let him show you how to increase your gas sales through increased use of hot water service. Humphrey merchandising plans—advertising copy and Humphrey cooperation are yours for the asking.

HUMPHREY
AUTOMATIC GAS WATER HEATER

A TYPE AND SIZE FOR EVERY PURSE AND PURPOSE . . . FROM THE SMALLEST HOME TO THE LARGEST BUILDING

HUMPHREY COMPANY DIV. RUUD MFG. CO. **KALAMAZOO, MICHIGAN**

Instantly Available!

the record of every METER

CAN your Meter Department answer these questions on any meter in 15 seconds? Is a meter in stock or in service and how long has it been there? What kind of current does it use? When and by whom was it tested last? Who is the customer and how long has he been one? Where is the meter located? What is the customer's business?

This book tells the story

Mail the coupon

THIS book tells how these questions can all be answered in 15 seconds. It tells how the Erie County Electric Company worked out a system that makes this remarkable feat possible for any public utility company.

Every public utility man should read this book. It's interestingly written, highly instructive and it's free. Just mail the coupon.

KARDEX

Division

Remington Rand Business Service *Inc.*, Buffalo, N. Y.

Branch offices in all principal cities

Kardex Division, Remington Rand Business Service *Inc.*, Buffalo, N. Y

Gentlemen:

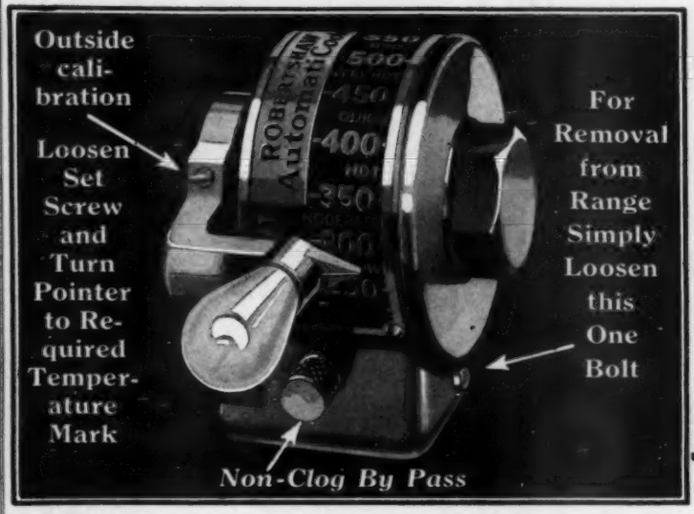
Send me your Meter Record book. If it's as good as you say, I'll read it thoroughly.

Name _____ Address _____

City _____ Position _____

A.G.J. 2

GAS COMPANIES and STOVE DEALERS



Appreciate the Exclusive Advantages of the "B" Type

ROBERTSHAW AutomatiCook

Outside Calibration. Takes just a few seconds to change the temperature setting if required, by means of a convenient set-screw on the temperature pointer. Merely loosen the set-screw, move the pointer to the proper temperature mark on the dial, and then tighten the set-screw.

Quick Removal. Should the "B" Type AutomatiCook become damaged for any reason, necessitating replacement, it can be removed without disconnecting the range or disturbing the linings or the piping. Requires no mechanical servicing or repairs on the job. Simply loosen one bolt, replace the Thermostat with a spare and tighten the bolt. The job can be done in less than a minute's time.

Non Clog By-Pass Pilot. Will not clog nor bind. Always moves freely and maintains its adjustment. Eliminates servicing, adjusted by turning either to the right or left.

Non-Corrosive Valve Seat. The AutomatiCook is now being equipped with a Raised Non-Corrosive Valve Seat which will resist the corrosive action of gas, eliminating any possible trouble from this source.

Write for 8-Page Folder, illustrating and describing the above advantageous features.

ROBERTSHAW THERMOSTAT CO.

Youngwood, Penna.

The Robertshaw AutomatiCook is now used on more than 80 leading makes of Gas Ranges

Six Major Improvements

1 Sprague Special Diaphragms
Acid resisting, semi-chrome retanned leather

2 Enclosed Top Bracket
Protects and lubricates the worm and gear

3 Improved Valve Cover
Eliminates possible breakage in transit

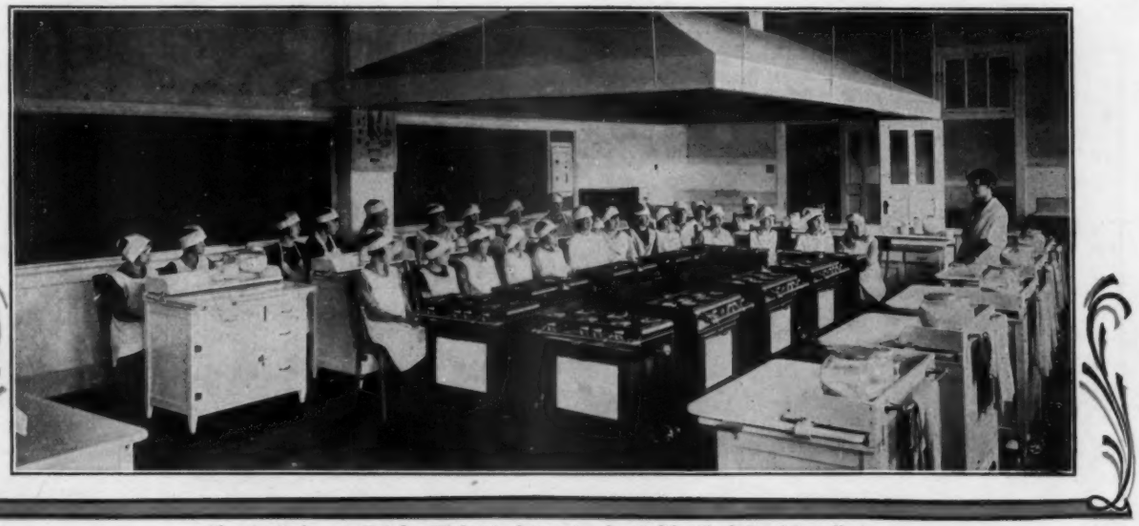
4 Raised Bosses on Flanges
Eliminate seepage in wet gases

5 Bronze Bushed Links
Reduce wear and lost motion

6 Improved Adjusting Tools
Reduce shop costs

All designed to better the one and a half million Sprague Meters in Service

THE SPRAGUE METER CO.
BRIDGEPORT, CONN.



Class in Cookery at Fairfax High School, Los Angeles, Calif., Clark Jewel Installation

The true order of learning should be first, what is necessary; second, what is useful, and third, what is ornamental. To reverse this arrangement is like beginning to build at the top of the edifice.

—MRS. SIGOURNEY

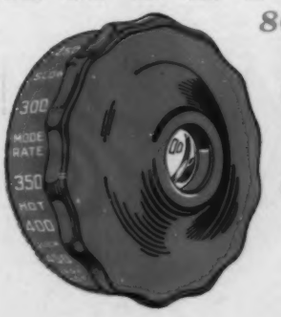
2750 Schools, Colleges and Universities in the United States now use Red Wheel Gas Ranges to teach students the art of modern cookery—the number of Red Wheel units per installation running from one to forty.

American Stove Co. knows of no better way to insure for its dealers a great and growing market for Red Wheel Gas Ranges than to do its utmost to see that wherever cookery is taught it shall be done by the rule of the Red Wheel.

AMERICAN STOVE COMPANY

801 Chouteau Avenue • • • • St. Louis, Mo.

LARGEST MAKERS OF GAS RANGES IN THE WORLD



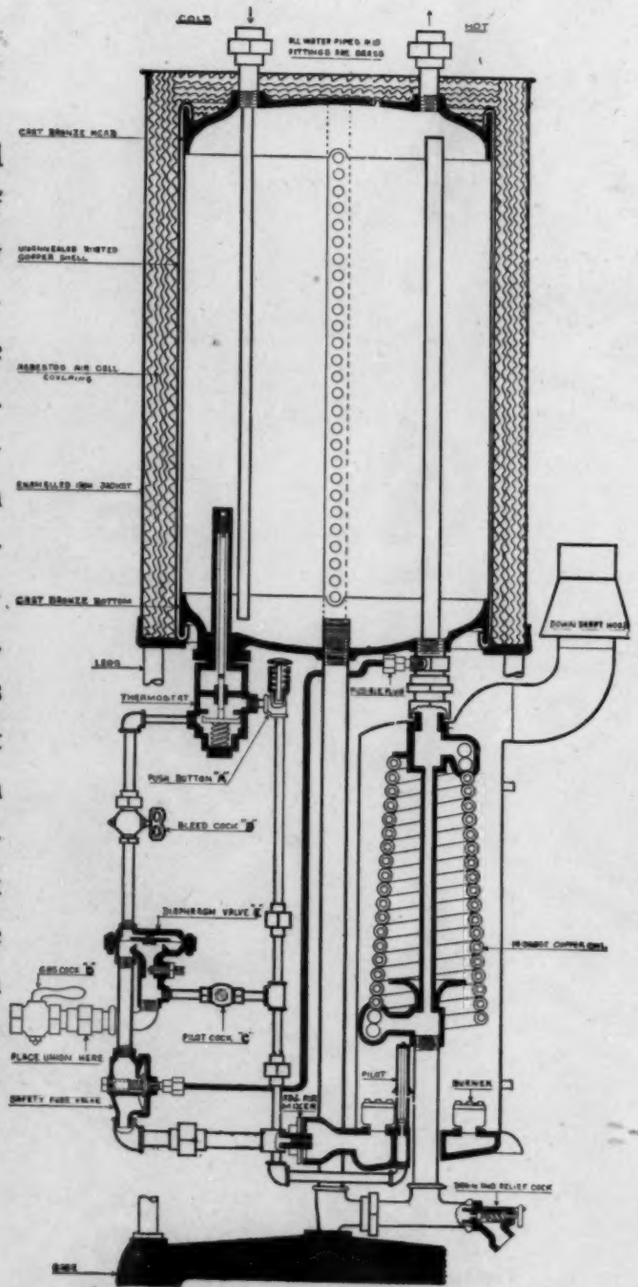
LORAIN RED WHEEL

These are the Six Famous Brands of Red Wheel Gas Ranges:

DANGLER · CLARK JEWEL · QUICK MEAL
DIRECT ACTION · NEW PROCESS · RELIABLE

KOMPAK BASIC PRINCIPLES

Through all the changes of the past few years in automatic storage water heaters. the basic principle upon which Kompak was originally built, still stands as the one perfect construction to give a maximum of hot water service from a given size boiler—at the lowest operating cost.



Copper Storage Tank.

Heating Coil under the boiler—

Circulation to the top of tank—

Thermostat in bottom of boiler—

Automatic pilot control.

Temperature shut-off valve.

Pressure relief valve.

Nowhere else can Kompak quality and Kompak exclusive feature be secured at Kompak prices—1928 has again demonstrated that the number of people wanting a good heater is constantly growing.

THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

they Boast of it!

A GAS consuming device so perfect in its performance that owners actually call attention to its use! They are proud of it because they cash in on its capabilities every day they use it. And you can readily enough cash in on those same capabilities.

SAVORY *Radiant* Automatic Toasters

Count the eating places in your district. You'll be surprised at the number of them—feeding the public is a big business. And every single place, from the smallest lunch counter to the largest hotel or restaurant, is interested in the machine that makes toast best, quickest and cheapest. That certainly describes the SAVORY *Radiant* Automatic Toasters—the *only* automatic toasters successfully using gas as fuel. More reliable than other automatic toasters, costs less to operate and turns out a superior product. An article that gives the dealer a real market and a real profit.

An absolutely practical machine that has met with a big success wherever introduced. Once sold it "stays put" and requires no servicing by the dealer. Built in a complete line of three sizes so as to fit the needs of any place, large or small. Hotels, restaurants, lunch counters, hospitals — all use it. Some buy as many as twenty machines.

SAVORY, Inc. DEPT. 40 90 ALABAMA STREET **Buffalo, N. Y.**

Owned and Managed by The Republic Metalware Co. Makers of Quality Cooking Equipment for 90 years.

READ THESE COMMENTS

"From a standpoint of convenience and economy of operation and quality of work performed, we believe it is the best toaster available today. We have increased our toast orders considerably. The fact that the bar clerks are able to make all of the toast indicates the ease with which the toaster is operated."
—LUNCH COMPANY

"Our repeat orders for your toaster should express our opinion very forcefully."
—BAKING COMPANY

"More than being a labor saving device, it has produced the best toast we have ever obtained from any machine. Our toast business has increased at least 25%."
—LUNCH COMPANY

"We find the gas-fired toaster is much easier to operate and enables us to obtain uniform toast at any time. We have eliminated all waste due to burnt toast. The operating expense is extremely low as compared with the electric machines."
—ONE OF AMERICA'S FINEST HOTELS.

Names of any of the above companies given upon request.

Type "M" Type "PD" Type "PS"

Write today for complete dealer information on this real profit item.

No. 300-R

— BARBER —

PATENTED

AUTOMATIC GAS BURNER

NOTE THESE EXCELLENT FEATURES:

Automatic Safety Pilot
Minneapolis Thermostat
Barber Butterfly Draft Door
Barber Form Fitting Baffles
Barber Jet Individual Pilots
Minneapolis Electric Gas Valve
Barber Pat'd Jet Burner Units
Barber Gas Distributing Header
Barber Clear Sweep Elbow Manifold

WINTER—the season for pushing gas as a house heating fuel. There could be no better times for telling you about the new Barber Patented AUTOMATIC Gas Burner.

Now the appeal for the *conversion* of coal-burning heaters can be made stronger than in any previous year. A greater number of prospects will be attracted by the luxury and convenience of automatic, carefree heater—that is economical, dependable and efficient.

The Barber Patented AUTOMATIC Gas Burner is a complete heating unit. It can be quickly installed. It is furnished with the best known Safety Pilot and Automatic Control devices. Uniform, healthful temperatures are provided day and night.

There is nothing to watch or regulate. The burner is lighted at the start of the heating season. It requires no attention until the gas is turned off for the warm months.

It is made in sizes and capacities to meet the heating requirements of all types of round or oblong furnaces and boilers—warm air, steam, hot water or vapor.

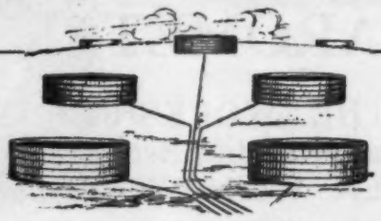
No. 300—R Burner for grate diameters from 19 to 23 inches.
No. 400—R Burner for grate diameters from 24 to 27 inches.
No. 500—R Burner for grate diameters from 28 to 32 inches.
Special Barber Patented AUTOMATIC Burners are supplied for sectional boilers. Also for furnaces and boilers having square or oblong fireboxes.

Write us for literature —attractive prices — and complete details

The CLEVELAND GAS BURNER & APPLIANCE CO.
Burner Specialists
3702-04 Superior Avenue, Cleveland, Ohio

Naylor Pipe of Toncan Iron Saves Twice

It Saves 30% In Erection Costs and Saves Again In Maintenance



NAYLOR pipe has a structure that permits a reduction of 50% in weight while carrying the same pressures as standard weight wrought pipe.

This saves 30% and sometimes more in the cost of erection. This alone justifies its use.

But Naylor Pipe has a further advantage. It is made of corrosion-resisting Toncan Iron. Toncan Iron contains both Copper and Molybdenum to fortify the natural corrosion-resistance of refined iron. Here, then, is the second economy of Naylor Pipe—it will last longer.

NAYLOR PIPE COMPANY

Main Office and Plant, 1230 East 92nd Street, Chicago

Sales Offices:

New York	Cleveland	Philadelphia	Detroit
25 Church St.	1367 East 6th St.	Witherspoon Bldg.	1500 Cadillac Sq. Bldg.

Tulsa—507 Philtower Building

DUCOMMUN CORPORATION

Los Angeles San Francisco

Exclusive Distributors: California, Arizona, Nevada, and Utah

Montreal, Canada—Mechanical Equipment Company, New Birks Building

TONCAN

Naylor Pipe

Mo-lyb-den-um

IRON

Standardized Naylor Pipe is made in sizes 6" to 12" in standard 20 ft. lengths or special lengths up to 40 ft. Made with 5 types of pipe ends to wrought pipe standards for 5 types of joints.

Toncan Copper Molybdenum Iron is a development of Central Alloy Steel Corporation, the world's largest and most highly specialized alloy steel producer. It possesses a superior corrosion-resistance, making it the favored pipe material.

Cut Maintenance Cost

and avoid frequent shut-downs with

R & E REFRACTORY CEMENTS

R&E

Water Gas

In a 12' Water Gas Set the lining was laid up with R & E 3000 and a wash coating of the same applied to prevent penetration and clinker adherence. After 1500 hours constant severe operation the generator was shut down for inspection. The lining was in excellent condition and the generator was again put in service for another 1500 hours. At the end of 3000 hours, R & E 3000 had established a record for severe duty far beyond any previous experience with other cements. R & E 3000 had saved a big repair charge.

R & E 3000 comes in plastic form ready for immediate use. It can safely be used for construction and patching work where temperatures do not exceed 3000° F. R & E 3000 is shipped in air-tight steel drums, 800 lbs., 500 lbs., and 100 lbs. Full directions on each drum.

Ask for booklet describing characteristics and uses of our special cements—wet or dry.

Gas Benches

Several months ago we patched a gas retort with R & E 3000, filling a hole 18" x 42". Several other cements had been tried on this repair job but all failed. Our patch with R & E 3000 is still there.

Coke Ovens

A large coke oven plant is using R & E 3000 to level the floors of the ovens when they become corrugated. Ask us how we did it. We'll gladly tell any coke oven superintendent.

Refractory & Engineering Corp'n.
50 Church St. **New York**

Western Representatives
The Gehnrich Corporation
327 So. La Salle St., Chicago

Distributors with Stock at Convenient Points

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY

1439 BRANDYWINE STREET - - - - - PHILADELPHIA, PA.

Make Your 1929 Distribution *Dollar go farther* by digging Trench with the CLEVELAND BABY DIGGER

For the Baby Digger has Extreme Mobility—

Efficient digging is quickly available for many jobs no matter where they are or what their size, for The Baby Digger can be loaded or unloaded on its special trailer in but five minutes and travels from location to location at truck speed—thus saving your distribution dollar even while traveling.

And Is Compact and Light—

The Baby Digger weighs only four tons. Its extreme width is but 58 inches. Thus it operates efficiently in limited working space (where a large percentage of your pipe is laid), as well as in the more open areas. The utility of this trencher saves money on more jobs and makes your distribution dollars go farther.

Rugged and Powerful—

The ruggedness of the Baby Digger has been proved by years of operation in some of the most difficult digging conditions found in this country. Wheel-type digging, backed by a fine, modern, mechanical design, and an abundance of power, insure steady operation and enhance the value of your distribution dollars.

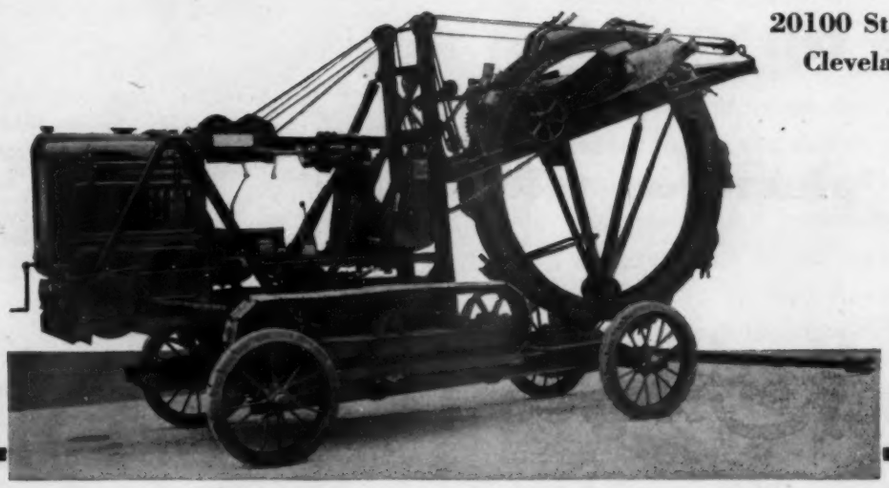
The Above Features—Plus—

Constant observation to anticipate the needs of the man on the job, and above all, to make every machine a better one than its predecessor, have won recognition by Gas Companies everywhere. Why not get complete information and make the distribution dollars go farther this year.

THE CLEVELAND TRENCHER COMPANY

"Pioneers of the Small Trencher"

20100 St. Clair Ave.
Cleveland, Ohio



This Little Trencher because it is Compact—Powerful—Sturdy—Flexible and Mobile has made machine Digging Profitable where it seemed impossible.

To The Industrial Sales Manager:-

THE American Gas Association stresses the necessity of improving the efficiency of existing industrial gas installations to meet increasing competition.

The installation of the

IMPROVED KEMP SYSTEM

on a performance basis is often the answer to this problem.

May we tell you about it?

Write, 'phone or telegraph.

The C.M. KEMP Mfg. Co.

Baltimore, Md.

for MIXING Gases

there's the CF

Differential Regulator

Use No. 1—To maintain a constant pressure ratio (differential) between manufactured and natural gas.

Use No. 2—To maintain a constant rate of flow, or line pressure.

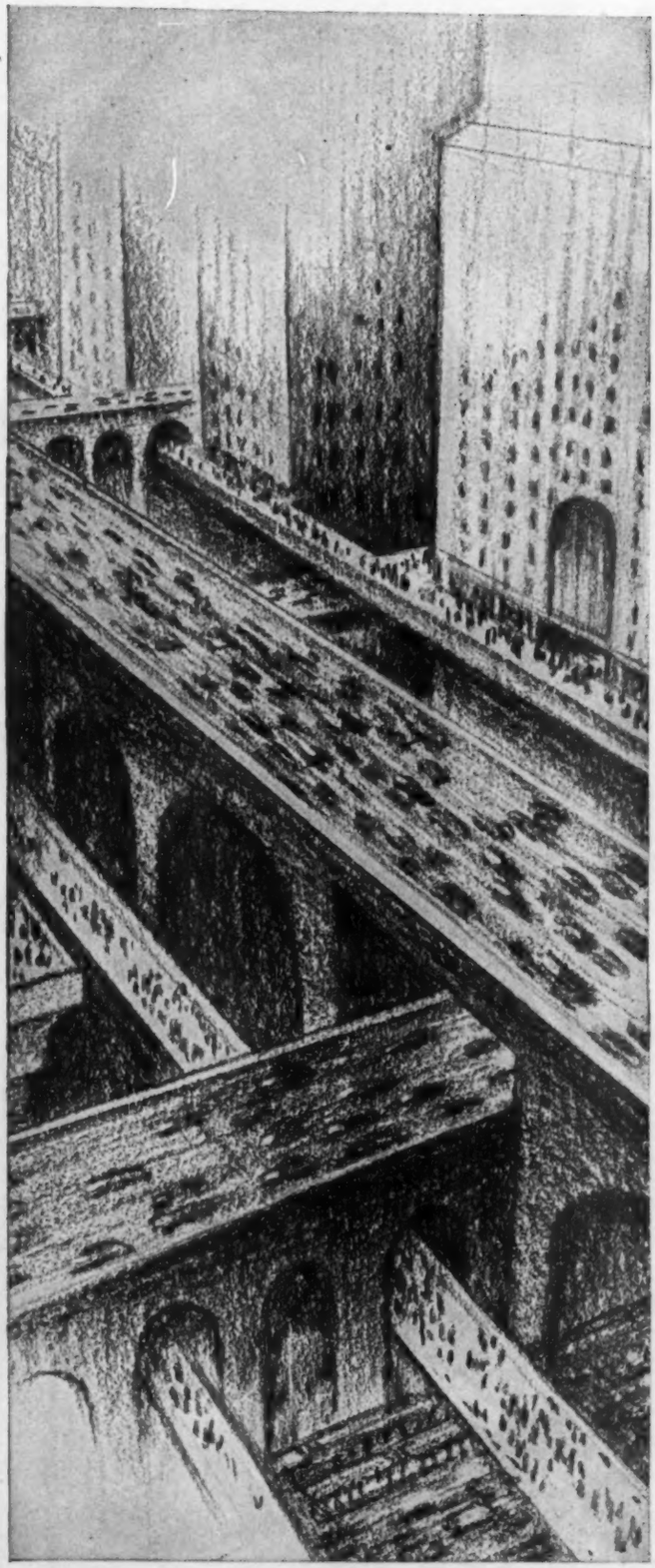
Use No. 3—To check the flow of and prevent the escape of large volumes of gas when breaks occur in line or holder.

In any of these three services, this regulator gives the same efficient results that the gas world expects from all *C-F* products for gas regulation.

A free bulletin explains the special applications and abilities of the *C-F* Differential Regulator for Mixing Gases.

The CHAPLIN-FULTON MFG. CO.

28-40 PENN AVE. PITTSBURGH, PA.



FOR CITIES WHICH LOOK 100 YEARS AHEAD

CITIES looking a century ahead are planning to meet problems undreamed of a decade ago. Problems involving underground and surface transportation . . . . pedestrian and motor traffic . . . . the interlocking problem of proper gas and water systems.

The streets of the future need never be torn up for pipe replacements. For cast iron pipe may be laid and forgotten. Cast Iron pipe's full span of life has never been measured. Mains that have served a century, two centuries, and longer, are still in service.

Cast Iron Pipe made by the members of The Cast Iron Pipe Research Association is manufactured under laboratory control to the modern standards of the Association members. The Association offers to taxpayers, city officials and engineers, information on every subject pertaining to the use of pipe for water, gas, sewers, road culverts and for industrial needs. All information is supplied without cost or obligation. Address: Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago.

CAST IRON PIPE

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY
TROY, N. Y.

New York 81 Fulton St. | Boston Tremont Bldg. | Philadelphia Harrison Building
Chicago The Rookery | Pittsburgh Oliver Bldg. | Kansas City R. A. Long Bldg.

Byllesby Engineering and Management Corporation

BYLLESBY ENGINEERING FINANCE MANAGEMENT
PIONEERS IN PUBLIC SERVICE

CHICAGO NEW YORK

Pittsburgh San Francisco

AMERICAN
Gas Maker's Gauge

The new American Gas Maker's Gauge is constructed so that there is perfect protection against loss of calibration due to accidental overloading. And in case of excess pressure, this gauge cannot be injured.

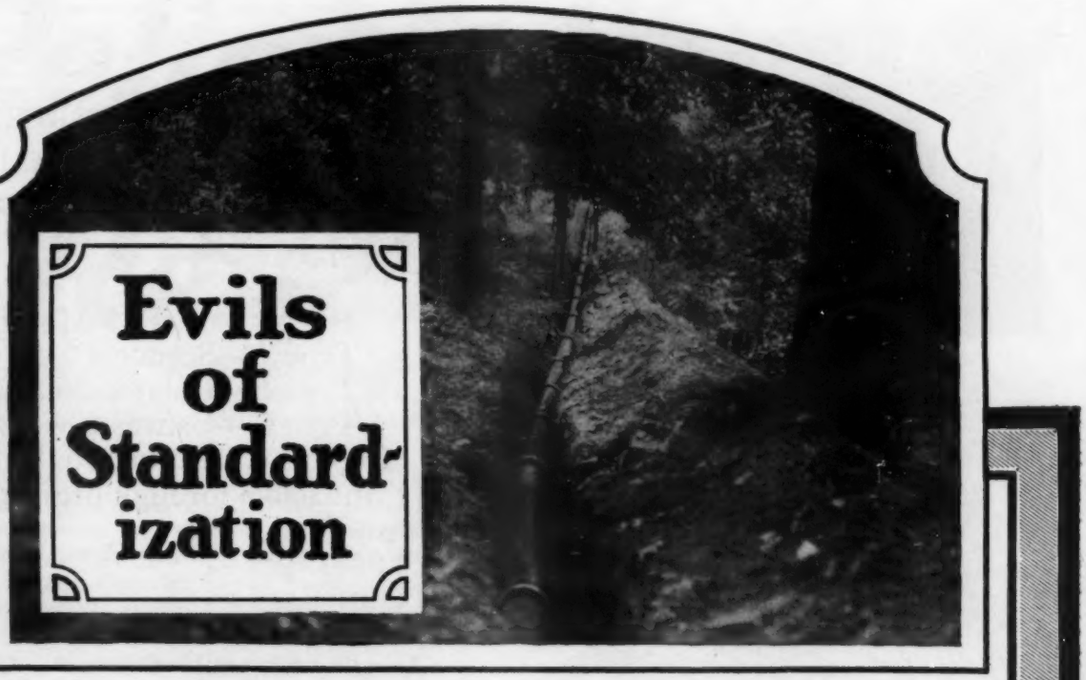
The full arc scale of 280°, with the subdivisions evenly graduated, shows the slightest fluctuation in single inches of water pressure.

Made in black enameled case and ring with either bottom or back connection. The dial sizes are 4½", 6", and 10". The standard ranges, in inches of water pressure, are: 0-20, 0-30, 0-60, 0-100 and 0-150.

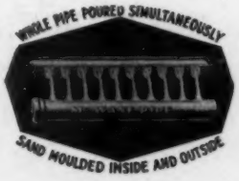
Write for these Catalogs

Gas Maker's Gauge	P-7
Recording Thermometer	H-7
Temperature Controller	R-7
Recording Gauge	E-7
Glass Thermometer	F-7

CONSOLIDATED ASHCROFT HANCOCK CO. INC.
Subsidiary of Manning, Maxwell and Moore Inc.
100 East 42nd Street, New York City



Evils of Standardization



THE best thing in the world carried to excess often loses its virtue.

Much has been said in the past few years to promote standardization in all lines of industry. But there are two sides to the question.

McWane cast iron pipe is an improvement in the art of pipe making. Therefore it does not comply with the old A.G.A. standard specifications. We quote from an editorial in a recent issue of Water Works Engineering magazine:

"Where devices and appliances are continually being improved, the adhering to old standards is a practice which seriously hampers the development of efficiency in a water works organization . . . There are but comparatively few appliances which stand a decade without some improvement being made in their design. And the water department that does not take advantage of these improvements is certainly not keeping pace with the times and improving its efficiency in pace with industrial development . . . Not only does it result in inefficiency but it frequently results in poor economy . . . Standardization is a good thing in its place. But it should not be so religiously followed as to prevent a department from securing the advantages incidental to later improvements."

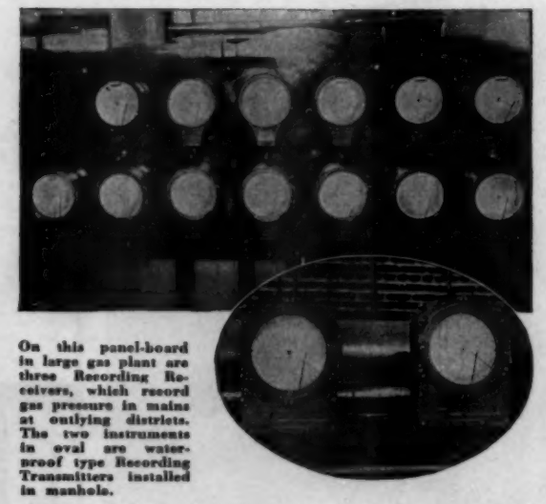
WRITE FOR ILLUSTRATED LITERATURE

McWANE CAST IRON PIPE CO.
BIRMINGHAM, ALA.

PACIFIC STATES CAST IRON PIPE CO.
PROVO, UTAH

SALES OFFICES IN PRINCIPAL CITIES

McWANE
CAST IRON PIPE



On this panel-board in large gas plant are three Recording Receivers, which record gas pressure in mains at outlying districts. The two instruments in oval are waterproof type Recording Transmitters installed in manhole.

...Gives Continuous Check on...

What pressure is being maintained at distant points in the gas distribution system . . .

Bristol's Long Distance Transmitting and Recording System consists of two instruments—a transmitter and receiver, electrically connected. The transmitting instrument is installed at some strategic pressure point, and the receiver, generally a recorder, mounted at the central plant, downtown gas office, superintendents office; or in fact may be located at any conveniently centralized point of control.

Under this arrangement pressures existing at outlying sections such as holders at end of branch mains; also in city mains during hours of peak demand, etc., can be watched closely and controlled in accordance with economy and good service.

Hundreds of successful installations evidence the ability of this Bristol's System to give thoroughly dependable service. Equipment is simply and ruggedly constructed to stand up under constant everyday use.

Have Bristol's Sales Engineers explain in detail. There's no obligation.

The Bristol Company
Waterbury, Connecticut

GOODMAN
Used since 1897
GAS MAIN STOPPER
Improved Locking Sleeve

STREET DEPARTMENT SUPPLIES

DEPENDABLE GAS MAIN BAGS
Type A—Seamless
Type B—Reinforced Seams
Type C—Canvas Covered
GOODMAN CYLINDRICAL STOPPER
Inflatable for high pressures
SOAP TAPE
BRUSHES
PLUGS
JOINT RUNNERS
AIRLINE MASKS

Safety Gas Main Stopper Co.
523 Atlantic Ave., Brooklyn, N. Y.

RITER-CONLEY CO.
STEEL CONSTRUCTION
PITTSBURGH

STEEL PLATEWORK
FOR
THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES
New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
San Francisco — Los Angeles

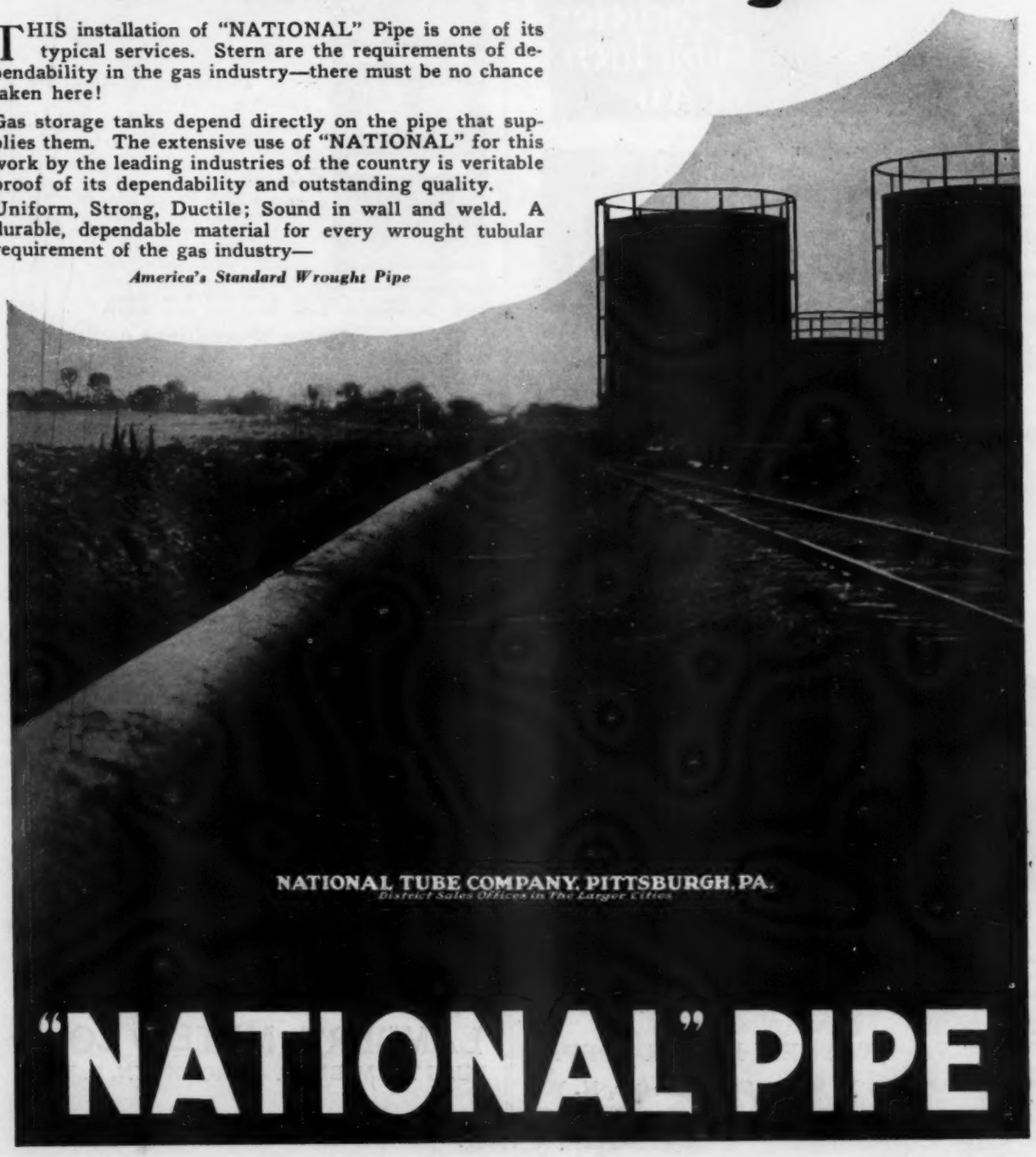
Reliable Storage Depends on Reliable Pipe

THIS installation of "NATIONAL" Pipe is one of its typical services. Stern are the requirements of dependability in the gas industry—there must be no chance taken here!

Gas storage tanks depend directly on the pipe that supplies them. The extensive use of "NATIONAL" for this work by the leading industries of the country is veritable proof of its dependability and outstanding quality.

Uniform, Strong, Ductile; Sound in wall and weld. A durable, dependable material for every wrought tubular requirement of the gas industry—

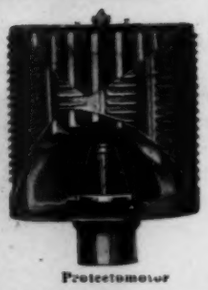
America's Standard Wrought Pipe



NATIONAL TUBE COMPANY, PITTSBURGH, PA.
District Sales Offices in The Larger Cities

"NATIONAL" PIPE

Look at any sunbeam and you will SEE dust. Study scientific charts and you'll find that each cubic inch of unfiltered air contains about 100,000 particles of dust—that with each million cubic feet of unfiltered air you compress you *also compress about a half pound of grit and abrasive matter.*


Protectomotor

Dirt and grit contacting with the smooth reciprocating parts of air-using machines and tools sounds the death warning to efficiency. It builds up destructive carbon deposits. And it guarantees frequent overhauling.

PROTECTOMOTOR
REG U S PAT OFF
99 9/10 Per Cent EFFICIENT
AIR FILTERS

Protectomotor Pipe Line Filter

Delivers clean, dry air, free from dust, water, oil, rust and scale, for paint spraying compressed-air tools, hoists, cleaning operations, agitating liquids, etc.

remove this costly foreign matter.

This simple device is guaranteed to deliver air 99.9% CLEAN. It increases operating efficiency by cutting carbon as much as 70%. It reduces wear on moving parts by as much as 85%. And it enables you to operate pneumatic equipment three to five times longer without stopping for overhauling.

The fact that over 250,000 Protectomotor Air Filters are in use is conclusive proof of its ability to reduce operating and maintenance costs of pneumatic equipment. ALL the facts are contained in our new booklet. It will pay you to write for it.

STAYNEW FILTER CORP.
115 N. Water St., Rochester, N. Y.

Hytempite Better days in Perfect Suspension
Shows thin joint obtained
Laying wall with Hytempite
Thick Clay Joints vs. Thin Hytempite Joints
Hytempite Joints have great strength

Utility and HYTEMPITE
(Reg. U. S. Pat. Off.)
"The Universal High Temperature Cement"
are Synonymous

HYTEMPITE is the ideal high temperature cement for Gas Plants, because it has many uses. HYTEMPITE

—insures quick, economical repairs of Retorts, Jamb Joints Furnace Walls, Arches and Baffles

—not affected by heating and cooling of ovens.

—can be used with salvaged, crushed old fire brick

—stands up under severe weather conditions.

—makes thin, strong joint between tile or brick that stands up under extreme abrasive action of clinker tools.

—easily shot into place with Quigley Refractory Gun.

Keep a drum of HYTEMPITE in Retort House or Boiler Room for quick repairs

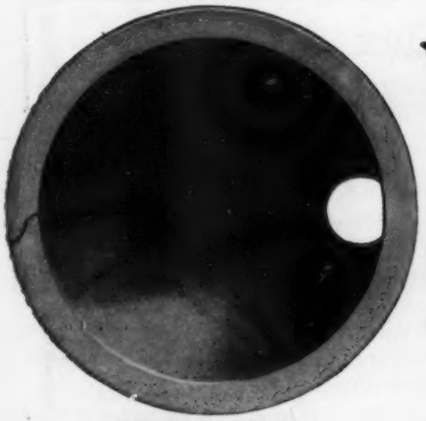
Quigley Furnace Specialties Co., Inc.
26 Cortlandt St. New York, N. Y.
Stock and Service in every Industrial Center.
"HYTEMPITE" is a Quigley Product.

LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

LAMBERT METER CO.
BUSH TERM. BLDG. 4, BROOKLYN, N. Y.



WELDED—WEAK

WHICH PIPE *Can You* TRUST?

SEAMLESS—SAFE

Which Pipe Do You Trust?

SOMETIMES we find proven method and actual practice at variance. Particularly is this true in the pipe line industry. Although Pittsburgh Seamless Line Pipe is fully one-third stronger than lap welded pipe, some operators are still indifferent to the extra expense directly resulting from the use of the lap welded product. Pittsburgh Seamless Line Pipe is both efficient and economical - - - efficient in regard to freedom from trouble and adaptability to higher operating pressures; economical in regard to laying, operating and maintenance costs. Pittsburgh Seamless steel line pipe has proven itself a time and money saver.

LENGTHS UP TO 45 FEET

Pittsburgh Steel Products Co.
DIVISION OF
Pittsburgh Steel Co.

PITTSBURGH CHICAGO NEW YORK HOUSTON DETROIT TULSA

Buyers' Reference Index

See page 129 for advertisements of these products

A. B. C. SELF CLINKERING GRATES
The Western Gas Construction Company.

ABSORBERS
Aluminum Co. of America

ACCUMULATORS—STEAM
The Gas Machinery Co.
Ruth's Steam Accumulator Co.
A. O. Smith Corp.
Smoot Engineering Corp.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

ACETYLENE
The Prest-O-Lite Co., Inc.
Oxweld Acetylene Co.

ACETYLENE EQUIPMENT
American Lava Corp.
Alexander Milburn Co.

ACCOUNTING MACHINES
Remington Rand, Inc.

AIR FILTERS
Staynew Filter Corp.

ALUMINUM PAINT
Aluminum Co. of Amer.

AMMONIA CONCENTRATORS
Bartlett Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA CONCENTRATED LIQUOR PLANTS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

AMMONIA PIPE
National Tube Company.

AMMONIA RECOVERY APPARATUS
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

AMMONIA TEST
American Meter Co.

APPRAISALS & INVENTORIES
Stacey Bros. Gas Construction Co.
United Engineers & Constructors, Inc.

APPARATUS
Laboratory Experimental
American Meter Co.
Service
American Meter Co.

ASH STORAGE BINS
C. W. Hunt Co., Inc.
Semet-Solvay Engineering Corp.
Riter-Conley Co.
The Stacey Mfg. Co.

AUDITS
United Engineers & Constructors, Inc.

AUTOMATIC CONTROLS FOR WATER GAS APP.
United Engineers & Constructors, Inc.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BACK PRESSURE VALVES
Connelly Iron Sponge & Governor Co.

BACKRUN GAS EQUIPMENT
Semet-Solvay Engineering Corp.

BAGS
Safety Gas Main Stopper Co.

BAROMETERS
Connelly Iron Sponge & Governor Co.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

BELTS
Conveyor and Elevator.
Robins Conveying Belt Co.

BENCHES
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Gas Machinery Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BENZOL
Bartlett-Hayward Co.
Carl Still, Inc.
The Koppers Construction Co.

BENZOL RECOVERY PLANTS
Semet-Solvay Engineering Corp.

BLOWERS
Industrial Burner
Connersville Blower Co.
Revivifying
Connersville Blower Co.
Water Gas Set
Connersville Blower Co.

BLOWERS & BOOSTERS
Gas Engineering Co.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BLUE GAS PLANT
Bartlett-Hayward Co.
Indugas, Inc.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corpn.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

BOOKKEEPING MACHINES
Remington Rand, Inc.

BOOSTERS
Connelly Iron Sponge & Governor Co.
Connersville Blower Co.

BRICK
Fire and Checker
Botfield Refractories Co.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment Co.-Russell Eng. Corp.
United Engineers & Constructors, Inc.
United States Refractories Corp.
Silica
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Company.
United States Refractories Corp.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
Alpha-Lux Co.

BUILDINGS
United Engineers & Constructors, Inc.

BURNERS (Industrial)
American Lava Corp.
The C. M. Kemp Mfg. Co.
Conversion
Cleveland Gas Burner & Appliance Co.
Conversion House Heating
Roberts Gas Burner Corp.
Fuel
Cleveland Gas Burner & Appliance Co.

BY-PRODUCT COKE
Semet-Solvay Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Carl Still, Inc.
The Gas Machinery Co.
International Coal Carbonization Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.
Alpha-Lux Company.
American Meter Co.
Consolidated Ashcroft Hancock Inc., Co.

CALORIMETERS
John J. Griffin & Company.

CALORIMETER ACCESSORIES
American Meter Co.

CARBIDE
Union Carbide Sales Co.

CARBONIZATION
The Gas Machinery Co.
Low Temperature
International Coal Carbonization Co.

CARBURETTED WATER GAS
The Western Gas Construction Co.

CARBURETTED WATER GAS PLANTS
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

CARS
C. W. Hunt Co., Inc.

CASINGS, SEAMLESS STEEL
National Tube Co.

CAST IRON PIPE
Bell
Cast Iron Pipe Research Ass'n.
Spigot
Cast Iron Pipe Research Ass'n.

CEMENTS
Quigley Furnace Spec. Co., Inc.
Acid-proof
Botfield Refractories Company.
Quigley Furnace Spec. Co., Inc.
Firebrick
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United States Refractories Corp.
High Temperature
Alpha-Lux Company.
Botfield Refractories Company.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.
United States Refractories Corp.
Refractory
Botfield Refractories Company.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Co.
Refractory Engineering Corp.
United States Refractories Corp.

CHAMBER OVENS
United Engineers & Constructors, Inc.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

CHUTES
Eaton-Kent, Inc.
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

CLAMPS (PIPE)
S. R. Dresser Mfg. Co.

CLOCKS & WATCHES, Stop
American Meter Co.

COALS
Boone County Coal Corpn.
Pittsburgh Coal Co.
Westmoreland Coal Co

COAL GAS APPARATUS
Bartlett-Hayward Co.
Carl Still, Inc.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Company.
The Western Gas Construction Company.

COAL & COKE BINS CASTINGS
The Koppers Construction Co.
The Stacey Mfg. Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Dry Quenching Equipment Corp.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.

COAL TAR PRODUCTS
International Combustion, Tar, and Chemical Corpn.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COAL TUBES
C. W. Hunt Co., Inc.
Meter
American Meter Co.
Superior Meter Co.
Service
American Meter Co.

COKE CRUSHERS
The Koppers Construction Co.
Robins Conveying Belt Co.

COKE QUENCHING
Dry Quenching Equipment Corp.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

COKE RECLAMATION SYSTEMS
C. W. Hunt Co., Inc.

COMPUTERS
Heating Value
United Engineers & Constructors, Inc.

CONDENSERS
Aluminum Co. of America.
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
High Duty
Stacey Bros. Gas Const. Co.
United Engineers & Constructors, Inc.

CONTRACTORS' TUBS
C. W. Hunt Co., Inc.

CONTROLS
The Bristol Company.
The Brown Instrument Co.
Robertshaw Thermostat Co.
Combustion
Smoot Engineering Corp.
Gas Pressure
Smoot Engineering Corp.
Gas Producer
Smoot Engineering Corp.
Hot Water Heat System
The Cleveland Heater Company.
Water Gas Machine
Smoot Engineering Corp.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Robins Conveying Belt Co.

CONCENTRATORS, AMMONIA
(See Ammonia Concentrators.)

COOLERS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
Air
Andale Company.
Ammonia Liquor
Andale Company.
Gas
Andale Company.
Oil
Andale Company.

COOLING COILS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

Incomparably Efficient

INCOMPARABLY efficient operation, greater economy and convenience — surplus water heating quality built into a new and radically improved water heater — this is the new Rex-Patrol. To heat water easily, quickly, economically, and clean, to provide an ample supply and to eliminate hot water shortage and inconvenience.

For many years Rex engineers have labored to solve this problem. They planned, they built, they tested. They destroyed and built again until they were satisfied and convinced that

Rex-Patrol
Water Heaters

do give "Carefree Hot Water Service."

Automatic Water Heaters not so long ago were only within reach of those people who could afford to excel in something different. The Rex-Patrol, however, is priced so low that it is within reach of everyone.

Thousands of dollars were spent in designing and building this great home convenience, this maintainer and preserver of health, this helper of cleanliness, this eliminator of laborious tasks.

We suggest that you do not delay any longer to get complete data and selling plans of this household necessity. Every day that you put it off, every week, every month you are losing money.

We invite you to send for the Rex Partnership Plan for Gas Companies.

The Cleveland Heater Co.
1900 West 112th St. Cleveland, Ohio

Every Load on the Truck Means a Load-Loss Here

EVERY time one of your subscribers sends her clothes away to be laundered it costs you money. *Your* company pays the bill—not in cash, but by the loss resulting from decreased gas consumption.

The family washing *should* be done at home and most housewives are reluctant to send fine linens, dainty underthings and baby's tiny garments out of the house to be indiscriminately washed and dried.

Whether or not the various gas companies are aware of this fact, another industry is keenly alive to the situation. That is why they are spending $20,000,000 in their efforts to get the laundry work *out of the home.*

What Are You Going To Do About It?

If you want to retain this domestic laundry load of 21,984 cu. ft. per meter annually from the average home, you've got to fight for it. And that fight means selling dryers—displaying dryers—talking dryers—MERCHANDISING dryers! Because when a housewife has a safe, thoroughly dependable, thermostatically controlled dryer to fill the gap between washer and ironer, the washing STAYS HOME!

Your company is vitally interested in this domestic laundry load and in keeping the washing at home —and so are we.

We are ready to talk dryers and dryer sales with gas company executives any time. Say when.

The W. E. Lamneck Company
444 Dublin Ave. Columbus, Ohio

Buyers' Reference Index

See page 129 for advertisements of these products

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Mfg. Co.
National Tube Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Victaulic Co. of Amer.

COUPLINGS—FLEXIBLE
The P. H. & F. M. Roots Company.

CUTTING APPARATUS & SUPPLIES
Alex and Milburn Co..
Union Carbide & Carbon Co.

CRUSHERS
Riter-Conley Company.

CUBIC FOOT BOTTLES
American Meter Co.
Lambert Meter Co.

DE-EMULSIFIERS
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

DEHYDRATORS, GAS
Andale Company.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.

DEMONSTRATION METERS
Lambert Meter Co.

DIAPHRAGMS
Lambert Meter Co.
(Meter)
American Meter Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.

DRAFT GAUGES
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

DRYERS (Laundry)
W. E. Lamnech Co.

ELECTRIC LOCOMOTIVES
C. W. Hunt Co., Inc.

ELEVATORS
C. W. Hunt Co., Inc.
Craig Ridgway & Son Co.
Robins Conveying Belt Co.

ENGINE INDICATORS
Consolidated Ashcroft Hancock Co., Inc.

ENGINEERS
American Meter Co.
The Gas Machinery Co.
Combustion
Bartlett-Hayward Co.
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.
United Engineers & Constructors, Inc.
Consulting
Bartlett-Hayward Co.
United Engineers & Constructors, Inc.
George H. Waring.
The Western Gas Construction Company.
Contracting
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Company.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
Riter-Conley Company.
Stacey Gros. Gas Const. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.
Distribution
United Engineers & Constructors, Inc.
Measurement
American Meter Co.

EXHAUSTERS
Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Company.
The P. H. & F. M. Roots Company.
The Western Gas Construction Company.

EXPANSION BENDS
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

FILES (Steel and Wood)
Remington Rand, Inc.

FILES (Visible)
Remington Rand, Inc.

FILTERS, Gas
American Meter Co.

FIREBRICK, CEMENT
General Refractories Co.
Quigley Furnace Specialties Co., Inc.

FIREBRICK CHECKER BRICK
(See Brick)
Botfield Refractories Company.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FIRST AID EQUIPMENT
United Engineers & Constructors, Inc.

FITTINGS
James B. Clow & Sons.
Isbell-Porter Company.
Kitson Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe and Foundry Co.
The Western Gas Construction Company.
Plain End and Flanged
Cast Iron Pipe Research Association.

FIXTURES
American Lava Corp.
General Gas Light Co.

FLOORS, IRON, BRICK, AND STEEL
The Gas Machinery Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

FLOW METERS
Brown Instrument Co., The
Lambert Meter Co.

FLUES
P. J. Hentschel

FLUE PIPE (Cast Iron Oval)
James B. Clow & Sons.
Semet-Solvay Engineering Corp.

FURNACES
Combustion Engineering Corpn.
James B. Clow & Sons.
Gas Fired
The C. M. Kemp Mfg. Co.
Gas Soldering
American Meter Co.

GAS ANALYSIS APPARATUS
Metric Metal Works.

GASKETS
American Meter Co.
Consolidated Ashcroft Hancock Co., Inc.
Pittsburgh Equitable Meter Co.

GAS COAL
Boone County Coal Corpn.
Pittsburgh Coal Co.
Westmoreland Coal Co.

GASOMETERS (Test)
American Meter Co.

GAS PLANTS, COMPLETE
Carl Still, Inc.
Gas Engineering Co.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.

GASSING MACHINE
American Meter Co.
Lambert Meter Co.

GAS TAPE
Connelly Iron Sponge & Governor Co.

GAS TESTING APPARATUS
Metric Metal Works.

GATE VALVES (See Valves)

GATES—WIND & BLAST
The P. H. & F. M. Roots Company.

GAUGE BOARDS
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
United Engineers & Constructors Inc.
The Western Gas Construction Company.

GAUGES
American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Lambert Meter Co.
Maryland Meter Co.
Metric Metal Works.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Taylor Instrument Companies.
The Western Gas Construction Company.
Mercury
Precision Thermometer & Instrument Company.
Pressure-Recording
Consolidated Ashcroft Hancock Co., Inc.
D. McDonald & Co.
Precision Thermometer & Instrument Company.
Siphon
Precision Thermometer & Instrument Company.
Tank
Precision Thermometer & Instrument Company.
Water
Precision Thermometer & Instrument Company.

GENERATORS, Oxygen & Acetylene
Alexander Milburn Co.

GLOVES
Rubber
Safety Gas Main Stopper Co.

GOVERNORS
Pittsburgh Equitable Meter Co.
Automatic
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.

GOVERNORS (Calorimeter and Double Dry)
American Meter Co.
Coke Oven
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
District
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Heime & McIlhenny.
Isbell-Porter Co.
Smoot Engineering Corp.
Exhauster
Connelly Iron Sponge & Governor Co.
Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
The P. H. & F. M. Roots Company.
Smoot Engineering Corp.
High Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
American Meter Co.
Connelly Iron Sponge & Governor Co.
Lambert Meter Co.
D. McDonald & Co.
Reynolds Gas Regulator Co.
Low Pressure
The Chaplin Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Lambert Meter Co.
Reynolds Gas Regulator Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Isbell-Porter Company.
Station
Heime & McIlhenny.

GRATES for Water Gas Generators
Semet-Solvay Engineering Corp.

GRAVITOMETERS
Precision Thermometer & Instrument Company.

GRIDS, for Scrubbers
Semet-Solvay Engineering Corp.

HEATERS
James B. Clow & Sons.
Feed Water
Andale Company.
House
American Gas Products Corp.
Cleveland Gas Burner & Appliance Co.
The Cleveland Heater Company.
Roberts Gas Burner Corp.
Room
American Gas Products Corp.
American Stove Company.
General Gas Light Co.
Homestead Heater Company.
Welsbach Company.
Water
The Cleveland Heater Company.
Humphrey Company.
Ruud Mfg. Co.
Kompak Company.
Welsbach Company.
Pittsburg Water Heater Co.

HIGH CAPACITY METERS
Lambert Meter Co.

HIGH PRESSURE PIPE LINES
The Western Gas Construction Company.

HOISTS
The Gas Machinery Co.
C. W. Hunt Co., Inc.
Robins Conveying Belt Co.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.

HOWARD AUTOMATIC CHARGERS
The Western Gas Construction Company.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
Improved Equipment-Russell Engineering Corp.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

HYDROGEN SULPHITE TEST (Apparatus)
American Meter Co.

HYDROMETERS
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

INCINERATORS, GAS-FIRED
Kernit Incinerator Co.

INDUSTRIAL GAS MIXERS
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Corp.
Smoot Engineering Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

IRON BORING OXIDE
Gas Purifying Materials Co., Inc.

IRON SPONGE
Connelly Iron Sponge & Governor Co.

INSTRUMENTS
Alpha-Lux Company.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Lambert Meter Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.
Recording
American Meter Co.

PUSHING THEM OFF THE FENCE!

From the latter part of February, hundreds of thousands of home owners who underestimated their winter's coal requirements will be buying coal hand to mouth until summer comes again. These same people are "on the fence." They have wanted gas house heating—but have hesitated about the expense.

You can sell nearly every one of these "on the fence" prospects with the Roberts Controlled Gas Heating Unit.

Study the following eight reasons why this Unit appeals to every one:

1st, it will convert their present furnace into a gas furnace.

2nd, it takes only a few hours to install; during cold weather this feature is very important.

3rd, its initial expense and operating costs are the smallest.

4th, it is the only atmospheric gas burner having the air-gas ratio controlled and directed *into the burner* to the points of combustion.

5th, special radiants giving highly radiant heat not obtainable with other materials.

6th, safety is insured with the Roberts special Safety Pilot in case of gas failure.

7th, it has complete automatic and thermostatic control.

8th, it has a heating efficiency of 75%-80%, whereas other burners seldom show over 50% to 65% efficiency.

With these not to be disputed claims of superiority, you can get a favorable decision very quickly from your most difficult prospects.

Write for our sales proposition—it will appeal to you just as well as the product itself.

Trade Mark

MOST HEAT PER DOLLAR !

Roberts controlled Gas Heating Unit for steam, Hot Water, and warm air.

Roberts Gas Burner Corporation

128 West Chippewa St., Buffalo, N. Y.

TIGHT

3 WAY HYDRAULIC "UP AND DOWN" STEAM VALVES

3 WAY HIGH TEMPERATURE GAS TRANSFER VALVES

STRAINERS FOR WATER

STRAINERS FOR OIL

OIL HEATERS

AMMONIA LIQUOR COOLERS

FEED WATER HEATERS

Using the Heat from the Gas As it Leaves the Wash Box

GAS DEHYDRATORS

GAS AFTERCOOLERS

ANDALE COMPANY

1600 ARCH STREET

PHILADELPHIA, PA.

HUNT

PIVOTED BUCKET CONVEYOR

The peculiar system of driving by pawls, of which the Hunt is the only type existent, relieves the wheel of all stress. The Hunt conveyor can assume twists impossible with a sprocket driven machine.

WE DESIGN AND BUILD:

Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope, and the "Flotograv" (Coke Reclamation System).

C.W. HUNT CO. Inc.

WEST NEW BRIGHTON, STATEN ISLAND, N. Y.

Chicago - Montreal - Boston

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See page 129 for advertisements of these products

JOINTS (Pipe)
S. R. Dresser Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
United Engineers & Constructors, Inc.
Victaulic Co. of Amer.
JOINT RUNNERS
Safety Gas Main Stopper Co.
LAMPS
General Gas Light Co.
LAMP POSTS
General Gas Light Co.
LAUNDRY EQUIPMENT
W. E. Lamnech Co.
LAVA BURNER GRIDS
American Lava Corp.
LAVA PILOT TIPS
American Lava Corp.
LINING—REFRACTORY
(See Refractory Linings
LOCKERS
Remington Rand Co.
LOOSE LEAF EQUIPMENT
Remington Rand Co.
LUX MATERIAL
Alpha-Lux Company.
LUX SPONGE
Alpha-Lux Company.
MANILA AND WIRE ROPE
C. W. Hunt Co., Inc.
MANOMETERS
Brown Instrument Co., The
Precision Thermometer & Instrument Company.
MANTLES
General Gas Light Co.
Welsbach Company.
MASKS—GAS
Safety Gas Main Stopper Co.
MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.
MEASURING CHUTES
C. W. Hunt Co., Inc.
MECHANICAL GENERATORS for Water Gas App.
United Engineers & Constructors, Inc.
METER CONNECTIONS
American Meter Co.
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Superior Meter Co.
Nathaniel Tufts Meter Works.
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METER TESTER, Hydro-Pneumatic
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Artificial
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Superior Meter Co.
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Helme & McIlhenny.
Lambert Meter Co.
Maryland Meter Works.
D. McDonald & Co.
Metric Meter Works.
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The Sprague Meter Co.
Superior Meter Co.
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American Meter Co.
Connersville Blower Co.
The Gas Machinery Co.
Orifice
American Meter Co.
Positive
The Sprague Meter Co.
Prepayment
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Proportional
The P. H. & F. M. Roots Company.
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Connersville Blower Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Co.
Metric Metal Works.
The P. H. & F. M. Roots Company.
Nathaniel Tufts Meter Works.
The Western Gas Construction Company.
Steam
American Meter Co.
The Gas Machinery Co.
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The Western Gas Construction Company.
Test
American Meter Co.
John J. Griffin & Company.
Maryland Meter Works.
D. McDonald & Company.
Metric Metal Works.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works.
Wet Test
American Meter Co.
MILLER GRIP PACKING
Connelly Iron Sponge & Governor Co.
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Roberts Gas Burner Corp.
Semet-Solvay Engineering Corp.
Smoot Engineering Corp.
MOISTURE DETERMINATORS
United Engineers & Constructors, Inc.
MOTOR CARS
C. W. Hunt Co ,Inc.
NAPHTHALENE EXTRACTORS
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The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
OFFICE FURNITURE
Remington Rand, Inc.
ORE, CHROME
E. J. Lavino & Co.
OVEN SHELF; SAFETY
Wm. Parke, Inc.
OVENS—COKE AND GAS
Carl Still, Inc.
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The Stacey Mfg. Co.
OXIDE
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co., Inc.
E. J. Lavino & Co.
OXYGEN
Linde Air Products Co.
OXYGEN AND HYDROGEN METERS
Lambert Meter Co.
PACKING
Asbestos
Safety Gas Main Stopper Co.
PAINTS
Aluminum Co. of America.
Safety Gas Main Stopper Co.
The Stacey Mfg. Co.
Wailes Dove-Hermiston Corp.
Metal Protective
Aluminum Co. of America.
Semet-Solvay Co.
PAINTS, ANTI ACID AND ALKALI
Aluminum Co. of America.
Quigley Furnace Spec. Co., Inc.
PAINTS, RUSTPROOF
Aluminum Co. of America.
Quigley Furnace Spec. Co., Inc.
PHOTOMETERS
Connelly Iron Sponge & Governor Co.
PIPE
Waylow Pipe Co.
Hedges-Walsh-Weidner Co.
National Tube Co.
The Stacey Mfg. Co.
Bell
American Meter Co.
Semet-Solvay Engineering Corp.
McWane Cast Iron Pipe Co.
Bell and Spigot
U. S. Cast Iron Pipe & Foundry Co.
Cast Iron
James B. Clow & Sons.
McWane Cast Iron Pipe Co.
U. S. Cast Iron Pipe & Foundry Co.
Flange
James B. Clow & Sons.
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Screw Joint Cast Iron Pipe
McWane Cast Iron Pipe Co.
Seamless Steel
Pittsburgh Steel Products Co.
Spigot
James B. Clow & Sons.
McWane Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Naylor Spiral Pipe Co.
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Bartlett-Hayward Co.
James B. Clow & Sons.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Pittsburgh Steel Products Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
Spiral Pipe
Naylor Spiral
Welded Steel
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
National Tube Co.
Riter-Conley Company.
Semet-Solvay Engineering Corp.
A. O. Smith Corp.
PIPE COATINGS
Wailes Dove-Hermiston Corp.
PLANTS—GAS, COMPLETE
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
The Koppers Construction Co.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.
PLATES
Cruse-Kemper Co.
C. W. Hunt Co., Inc.
The Stacey Mfg. Co.
The Western Gas Construction Company.
Floor
Gas Engineering Co.
The Gas Machinery Co.
Riter-Conley Company.
United Engineers & Constructors, Inc.
PLUGS, SERVICE AND MAIN
Rubber
Safety Gas Main Stopper Co.
Soft Wood
Safety Gas Main Stopper Co.
PORTABLE TEST METERS
Lambert Meter Co.
PRODUCER GAS PLANT
Gas Engineering Co.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.
PRODUCER GAS STEAM
American Meter Co.
PROVERS—Critical Flow for H. P. Field Testing
American Meter Co.
PROVERS—METER
John J. Griffin & Company.
Helme & McIlhenny.
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co.
Superior Meter Co.
PUMPS
Drip
American Meter Co.
The Gas Machinery Co.
Lambert Meter Co.
D. McDonald & Co.
Gas
The P. H. & F. M. Roots Company.
Gas Bag
Safety Gas Main Stopper Co.
Hand
Lambert Meter Co.
Oil
Connersville Blower Co.
The Gas Machinery Co.
D. McDonald & Co.
The P. H. & F. M. Roots Company.
Power
Connersville Blower Co.
The P. H. & F. M. Roots Company.
Pressure
Connersville Blower Co.
The P. H. & F. M. Roots Company.
Service
American Meter Co.
Lambert Meter Co.
Superior Meter Co.
Service Cleaner
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
Safety Gas Main Stopper Co.
Superior Meter Co.
Tar
Connersville Blower Co.
The P. H. & F. M. Roots Company.
Water
Connersville Blower Co.
The P. H. & F. M. Roots Company.
Vacuum
American Meter Co.
Connersville Blower Co.
The P. H. & F. M. Roots Company.
PUMPS—LIQUID ROTARY
The P. H. & F. M. Roots Company.
PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co
Semet-Solvay Engineering Corp.
Stacey Bros. Gas. Const. Co.
The Stacey Mfg. Co.
Riter-Conley Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.
PURIFYING MATERIALS
Alpha-Lux Company.
Connelly Iron Sponge & Governor Co.

WESTMORELAND "CRITERION" GAS COAL

The Standard for Gas Making Since 1854

Since this Company commenced operations, its well-known Westmoreland "Criterion" Gas Coal has been largely used by the Gas Companies of Northeastern United States and Canada, and its character is established as having no superior in gas giving qualities and freedom from sulphur and other impurities.

Mines situated on the Pennsylvania Railroad.
in Westmoreland County, Pa.

THE WESTMORELAND COAL COMPANY
Principal Office, Lewis Building, 15th and Locust Sts., Philadelphia, Pa.
Shipping Ports: Philadelphia, Baltimore, South Amboy, N. J., Lake Ports.

ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P C

Manufacturers of All Kinds of Gas Apparatus

NEWARK - NEW JERSEY

LAVINO OXIDE

Intensely Active. High Total Sulphur Absorption at Minimum Cost.

"THE EFFICIENT PURIFIER"

The Sponge with the large Tough Shavings Always Uniform

LAVINO SPONGE

E. J. LAVINO and COMPANY - BULLITT BLDG. - PHILADELPHIA, PA.
NEW YORK CHICAGO PITTSBURGH

GAS ENGINEERING CO.

Manufacturers of Gas Production Equipment
TRENTON, N. J.

JOHN S. UNGER
GAS ENGINEER
Specialist in Ammonia Recovery and Manufacture of Ammonia Products, Builder of Unger Ammonia Stills
640 GRACE ST., CHICAGO

Improved Equipment-Russell Engineering

HORIZONTAL GAS OVENS. COAL GAS PLANTS. BENCHES-STOP-ENDS & THROUGHS.

NEW YORK · Corporation · CHICAGO

REFILLINGS. ADDITIONS. REPAIRS. IMPROVEMENTS. EXTENSIONS. APPARATUS

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The Gas Machinery Co.
Gas Purifying Materials Co., Inc
The Koppers Construction Co.
E. J. Lavino & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
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Cruse-Kemper Co.
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Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

PYROMETERS
Maryland Meter Works
The Bristol Company.
The Western Gas Construction Company.
Indicating
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.
Radiation
Taylor Instrument Companies.
Recording
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.

RADIATORS
Gas Steam
American Gas Products Corp.
James B. Clow & Sons.
Gas Water
James B. Clow & Sons.

RANGES—GAS
American Stove Co.
Eriez Store Mfg. Co.

RECORDING DEMAND METERS
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Maryland Meter Works

REFRACTORY CEMENTS
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The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
E. J. Lavino & Co.
Quigley Furnace Spec. Co. Inc.
Refractory & Engineering Corp.
United States Refractories Corp.

REFRACTORY GUN
Botfield Refractories Company
Quigley Furnace Spec. Co. Inc.

REFRACTORY LININGS
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Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
Quigley Furnace Spec. Co. Inc.
United Engineers & Constructors Inc.
The Western Gas Construction Company
United States Refractories Corp.

REGULATORS
American Meter Co.
The Chaplin Fulton Mfg. Co.
Connersville Blower Co.
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Taylor Instrument Companies
Air Pressure
Smoot Engineering Corp.
Coke Oven Suction Main
Smoot Engineering Corp.
Exhauster
Smoot Engineering Corp.
Furnace Pressure
Smoot Engineering Corp.
Oven
American Stove Co.
Oxygen & Acetylene
Alexander Milburn Co.
Steam Pressure
Smoot Engineering Corp.

REPAIR PARTS
Lambert Meter Co.

RESPERATING OUTFITS
Connelly Iron Sponge & Governor Co.

RETORTS
Horizontal and Inclined
Improved Equipment—Russell Engineering Corp.
Vertical
United Engineers & Constructors Inc.
West Gas Improvement Co.
Silica and Clay
Improved Equipment—Russell Engineering Corp.
The Gas Machinery Company
United States Refractories Corp.

RETORT CEMENT
Alpha-Lux Company
Botfield Refractories Company
The Gas Machinery Co.
Improved Equipment—Russell Engineer Corp.
Quigley Furnace Spec. Co. Inc.
Refractory & Engineering Corp.
United States Refractories Corp.

REVERSE FLOW GOVERNORS
Connelly Iron Sponge & Governor Co.

REYNOLDS
District
Reynolds Gas Regulator Co.

RUBBER AND JUTE JOINTING MATERIALS
Southwestern Pipe Joint & Eng. Co. Inc.

SAFES
Remington Rand Inc.

SAFETY VALVES
Connelly Iron Sponge & Governor Co.

SCREENS
Robins Conveying Belt Co.

SCREENS, ELECTRIC VIBRATING
C. W. Hunt Co. Inc.

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The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
West Gas Improvement Co.
The Western Gas Construction Company

SERVICE BOXES
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The Stacey Mfg. Co.

SERVICE CLEANERS
American Meter Co.

SERVICE PLUG-RUBBER
Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

SHELVING (Steel)
Remington Rand Inc.

SKIP HOIST
C. W. Hunt Co. Inc.

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American Meter Co.

SPECIFIC GRAVITY GAUGES
Alpha-Lux Company.

SPONGE
Alpha-Lux Company
Connelly Iron Sponge & Governor Co.
Gas Purifying Materials Co. Inc.

SPRAYS, for Water Gas Machines
Semet-Solvay Engineering Corp.

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Alexander Milburn Co.

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D. McDonald & Co.
Metric Metal Works

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United Engineers & Constructors Inc.
The Western Gas Construction Company

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Andale Company

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Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

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Welsbach Street Lighting Co.

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Smoot Engineering Corp.
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Turbo-Generators.
Amer. Brown Boveri Elec. Co.
Hot Water Heat Control
The Cleveland Heater Company

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Remington Rand, Inc.

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Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.

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Gas Engineering Co.
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The Western Gas Construction Company.
Gas, Oil, Storage
Stacey Bros. Gas Const. Co.
High Pressure
The Gas Machinery Co.
Riter-Conley Company.
Stacey Bros. Gas Const. Co.

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West Gas Improvement Co.

TAR DISPLACEMENT SYSTEM
The Gas Machinery Co.

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Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
West Gas Improvement Co.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

TEMPERATURE CONTROLING DEVICE—Oven
American Stove Co.
The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.
Robertshaw Thermostat Co.
Taylor Instrument Companies.

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American Meter Co.
Pittsburgh Equitable Meter Co.
Precision Thermometer & Instrument Company.

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American Meter Co.
The Bristol Company.
Brown Instrument Co., The
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works.
Precision Thermometer & Instrument Company.
Superior Meter Co.
Taylor Instrument Companies.

THERMOSTATS
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Brown Instrument Co., The
The Cleveland Heater Company.
Consolidated Ashcroft Hancock Co., Inc.,
Precision Thermometer & Instrument Company.
Robertshaw Thermostat Co.
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Savory Co., Inc.,

TOOLS
Semet-Solvay Engineering Corp.

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Oxweld Acetylene Co.
Union Carbide & Carbon Co.

TRAPS—STEAM
James B. Clow & Sons.
Consolidated Ashcroft Hancock Co., Inc.

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The Cleveland Trencher Co.

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National Tube Co.
Pittsburgh Steel Products Co.

TUBES
Seamless Steel
Pittsburgh Steel Products Co.

TURBO-BLOWERS & COMPRESSORS
American Brown Boveri Elec. Corp.

TYPEWRITERS
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Remington Rand, Inc.

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Connelly Iron Sponge & Governor Co.,
The Gas Machinery Co.
Lambert Meter Co.
Pittsburgh Equitable Meter Co.
Precision Thermometer & Instrument Company.
Safety Gas Main Stopper Co.
Superior Meter Co.
Taylor Instrument Companies.

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The Bristol Company.
Brown Instrument Co., The
Consolidated Ashcroft Hancock Co., Inc.,
Lambert Meter Co.
Pittsburgh Equitable Meter Co.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies.

VALVES
Bartlett-Hayward Co.
James B. Clow & Sons.
Consolidated Ashcroft Hancock Co., Inc.,
Darling Valve and Manufacturing Co.
The Gas Machinery Co.
Groble Gas Regulator Co.
C. W. Hunt Co., Inc.
The Ludlow Valve Mfg. Co.
Pittsburgh Equitable Meter Co.
Semet-Solvay Engineering Corp.
High Pressure Special
Smoot Engineering Corp.

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VALVES—DIAPHRAGM
The P. H. & F. M. Roots Company.

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Darling Valve and Manufacturing Co.
James B. Clow & Sons.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.

VALVES—HUNTOON
The P. H. & F. M. Roots Company.

VALVES—RELIEF
The P. H. & F. M. Roots Company.

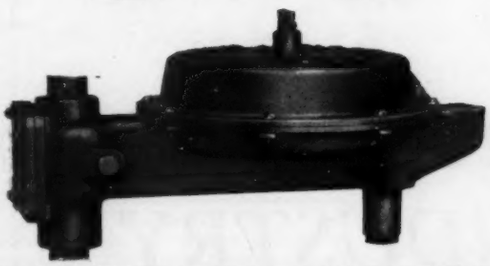
VALVES—3 Way
Semet-Solvay Engineering Corp.

WASTE HEAT BOILERS
(See Boilers)
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

WATER GAS APPARATUS
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

WELDING EQUIPMENT
Oxweld Acetylene Co.

GROBLE
REGULATORS & GOVERNORS



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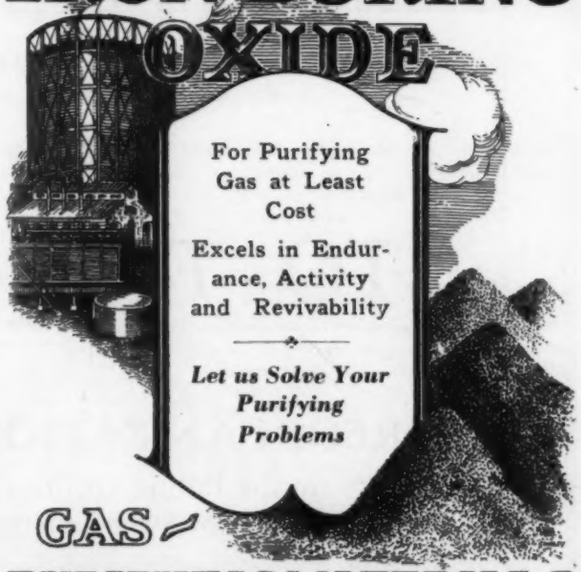
Midland Supply Co., Dwight Bldg., Kansas City, Mo.
Seidenglanz & Co., Second Unit, Santa Fe Bldg., Dallas.
Fagan-Andrews Co., 135 Michigan St., Milwaukee

IRON BORING OXIDE



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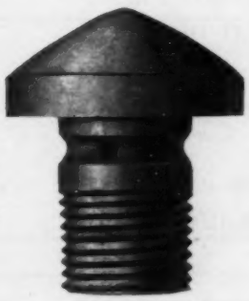
Excels in Endurance, Activity and Revivability

Let us Solve Your Purifying Problems

GAS PURIFYING MATERIALS COMPANY INC.

FOOT OF HALSEY STREET · · · LONG ISLAND CITY
NEW YORK
BRANCH YARD—PROVIDENCE, R. I.

Gas Outlets



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American Lava Corporation

29-59 William St. Chattanooga, Tenn.

Manufacturers of Lava Tips & Heat Resistant Insulators

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need health as much as he did—and more—for modern life has brought destructive forces—for instance—there are the deadly effects of carbon monoxide gas of the city streets to be overcome somehow—and the way to counteract them is to hasten to

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which awaits you with an air of comfort and cordiality—and with good food to supplement the good effects of the good air.

10-story fireproof addition *Special rates*
On the Boardwalk

SERVICE TO THE INDUSTRY

REORGANIZATIONS and MERGERS

of the Public Utilities resulting in economies of operation have benefited the entire gas industry.

MANUFACTURERS OF GAS APPLIANCES now realize the necessity of a similar development in their industry if they are to be of real service to the Utilities in the matter of future sales and dealer cooperation.

INVESTIGATION OF THE INDUSTRY

has shown decided opportunities for economies in manufacturing and marketing. Many manufacturers can improve their situation by *Reorganization, Merger or Refinancing.*

PERMANENT CAPITAL—

is available through my association with reliable banking institutions in Chicago—New York—Philadelphia.

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May we have the pleasure of serving you?

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Holding Company desires the services of good distribution engineer thoroughly competent to take over construction of transmission and distribution lines. State qualifications and salary expected in first letter. Address Box 956, c/o American Gas Journal, 53 Park Place, N. Y. C.

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WANTED—SALESMAN—For a high-grade line of Gas Ranges, both domestic and hotel types—one with experience and some acquaintance with Public Service Companies in Michigan, Indiana, Illinois and Iowa preferred. A good opportunity for a live man. Address Box 960, c/o American Gas Journal, 53 Park Place, New York City.

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Position Wanted by practical gas manager with 23 years experience. Coal & Water Gas. High & Low Pressure Good merchandiser. Will go anywhere. Available immediately. Address Box 961, c/o American Gas Journal, 53 Park Place, New York City.

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For Sale—1000 reconditioned McDonald, Maryland and Standard, 3 and 5 light prepay meters. These meters are in first class condition and will be equipped with appropriate rate wheels and painted to suit the purchaser. Price $7.25 each in hundred lots, f.o.b. cars, Portland, Oregon. Sample will be furnished willingly. Portland Gas & Coke Co., Public Serv. Bldg., Portland, Ore.

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AMERICAN LIGHT & TRACTION COMPANY

"DIVIDEND NOTICE"

The Board of Directors of American Light & Traction Company, at a meeting held January 8, 1929, declared a CASH DIVIDEND of one and one-half per cent of two and one-half (2½%) on the Common Stock, both payable February 1, 1929, to stockholders of record at the close of business January 17, 1929.

The transfer books will close at 3 o'clock P. M., January 17, 1929, and will reopen at 10 o'clock A. M., January 21, 1929.

James Lawrence
Secretary

GEORGE H. WARING
CONSULTING ENGINEER
624 GRAND RAPIDS NATIONAL BANK BLDG.
Grand Rapids, Mich.

EMPLOYMENT SERVICE

To Those Desiring a Position

Register your name with the American Gas Journal if you contemplate making a change in your present position.

We frequently hear of vacancies in the industry which might interest you.

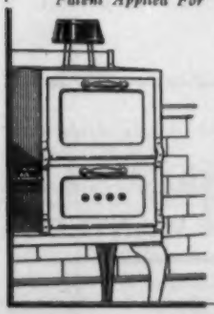
To the Gas Companies

When vacancies occur in any of the various departments of your organization, communicate with us, we may have the man you want.

The service in each case is both free and confidential.

AMERICAN GAS JOURNAL.

MONARCH FLUE
P. J. Hentschel
434 N. Front St.
Baltimore, Md.
Patent Applied For



The newest and best flue now made. Perfected after years of study and research. Surpasses any flue now on the market. Prevents your kitchen walls from becoming smoky and does away with all grease and dirt. Pays for itself in the gas it saves. Order today and see your gas bills fall.

Comes in Black Japan for $1.00
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Also in colored enamel.
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FOR HIGH PRESSURES
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AMERICAN GAS JOURNAL

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ADACHROME
Fines
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Gun

IF you will send us an outline of your refractories difficulties, we shall be glad to submit suggestions.
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Swanson and Clymer Sts., Philadelphia, Pa.

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GAS RETORTS and BOILER SETTINGS
FINE GROUND CLAY — SILICA CEMENT
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FRANKLIN Gas Burner—
Automatic regulation of air assures intense blue flame under all conditions. Burns natural or artificial gas or their combination. Flame will not extinguish on low pressure. No backfiring in the mixer. Approved by the fire insurance companies.
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guaranteed to always run uniform. It has been used by Gasworks all over the world for nearly 50 years. We offer same from a shipping point most conveniently located to your works. Shipped in bulk or bags.

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THE PERFECT READY MIXED OXIDE
For Gasworks having no facilities to mix their own Sponge we offer our celebrated "Lux-Sponge," guaranteed efficient for Coal or Water Gas.
Samples upon request.

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192 FRONT STREET - NEW YORK CITY, N. Y.

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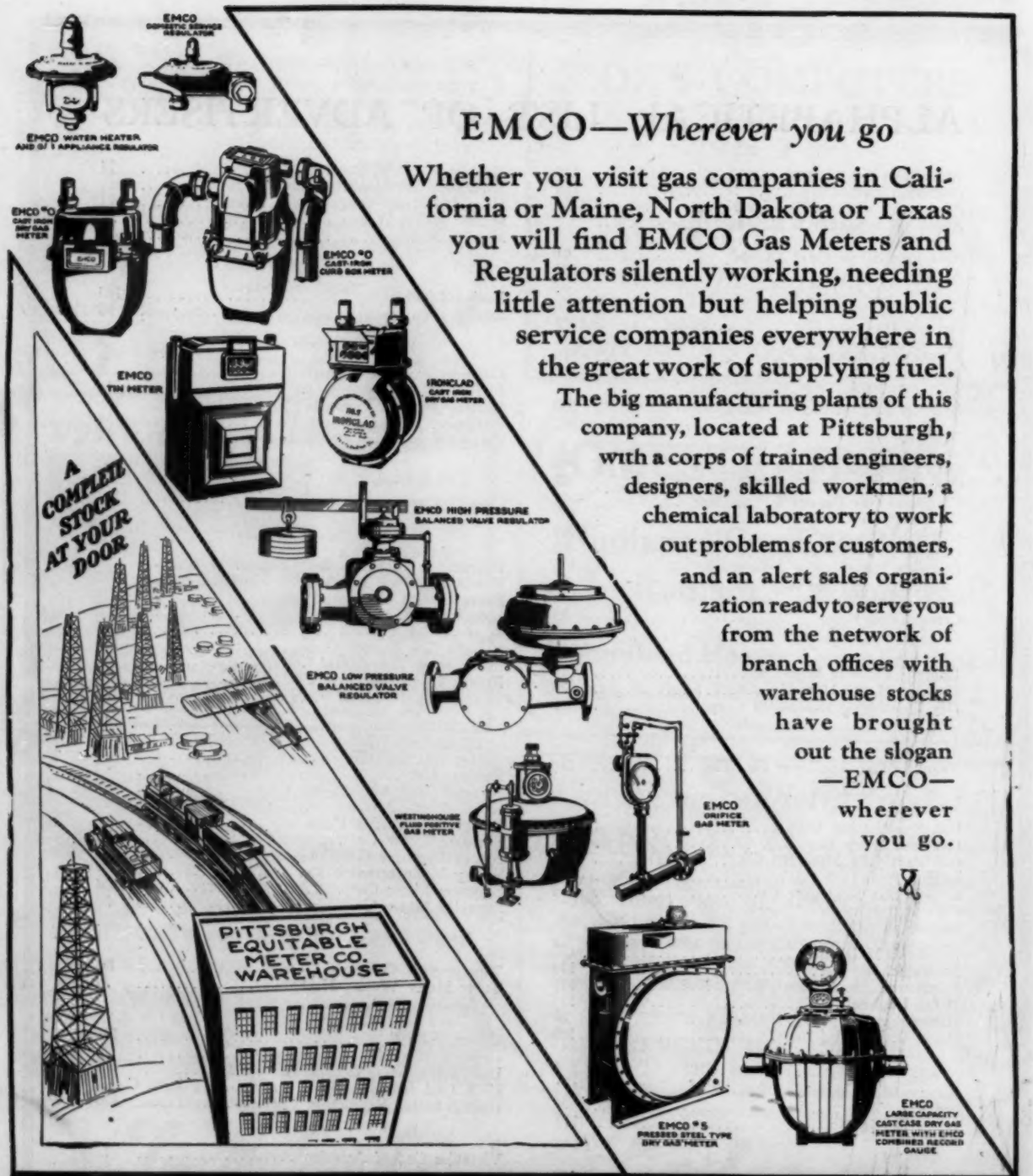
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EMCO TIN METER
IRONCLAD CAST IRON DRY GAS METER
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EMCO LARGE CAPACITY CAST CASE DRY GAS METER WITH EMCO COMBINED RECORD GAUGE

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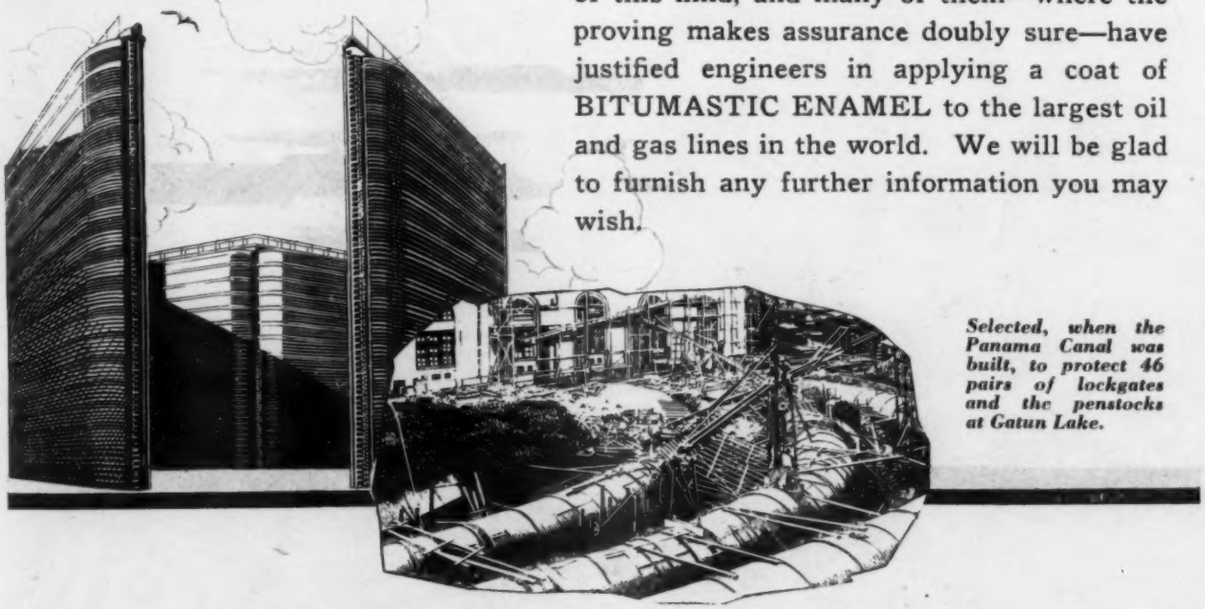
A 250 mile 20" gas line with an extension of 170 miles. Protected for 95% of the entire distance with BITUMASTIC ENAMEL.

If a pipe line coating will survive when exposed to the highly corrosive waters of Gatun Lake, it is *certain* to survive on a gas or oil line where conditions are less severe. Proofs of this kind, and many of them—where the proving makes assurance doubly sure—have justified engineers in applying a coat of BITUMASTIC ENAMEL to the largest oil and gas lines in the world. We will be glad to furnish any further information you may wish.



Selected, when the Panama Canal was built, to protect 46 pairs of lockgates and the penstocks at Gatun Lake.

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ENAMEL

Wailes Dove-Hermiston Corporation

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This machine applies this $F_c = \frac{Wv^2}{gR}$ formula and makes a cast iron pipe which is 25% stronger

"If you cast molten iron under pressure," said engineers, "the result will be a dense tough metal of great tensile strength." The theory was correct, but high manufacturing costs made its practice seem improbable in the production of cast iron pipe . . . This was before the world had heard of deLavaud cast iron pipe.

In the deLavaud process, the molten metal is fed into a revolving cylindrical mold. Centrifugal force holds the metal against the sides of the mold and drives impurities out *with a force 40 times greater than gravity.* Slag and gas bubbles are driven out of the metal at the center.

Exhaustive laboratory and factory tests have proved that deLavaud Pipe has a tensile strength of 30,000 lbs. per square inch. Because of its dense, close-grained structure, its freedom from impurities, and high tensile strength, deLavaud is 25% stronger than any other cast iron pipe. This strength permits a thinner pipe for the same outside diameter resulting in greater carrying capacity.

Write for handbook of de Lavaud Pipe which gives a fund of useful information including dimension tables and types of joints.

de Lavaud Pipe
made by
United States Cast Iron Pipe and Foundry Co., Burlington, New Jersey

Sales Offices: Chicago, Philadelphia, Buffalo, Cleveland, New York, San Francisco, Los Angeles, Seattle, Birmingham, Dallas, Kansas City, Pittsburgh, Minneapolis